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DB Name	Query	Hit Count	Set Name
USPT	l14 and (l2 or l3) not l4	11	L15
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JPAB,EPAB,DWPI	l12 not l10	26	L13
JPAB,EPAB,DWPI	l8 and recombinant	34	L12
JPAB,EPAB,DWPI	propanediol and plasmid	1	L11
JPAB,EPAB,DWPI	(diol or glycerol) near2 (dehydrase or dehydratase)	21	L10
JPAB,EPAB,DWPI	dha$5 and propanediol	1	L9
JPAB,EPAB,DWPI	dha$5 or propanediol	5534	L8
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USPT	(l3 same l2) not l5	3	L6
USPT	l3 with l2	9	L5
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USPT	propanediol	17930	L3
USPT	dha$5	4012	L2
USPT	((435/158)!.CCLS.)	111	L1

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DB Name	Query	Hit Count	Set Name
JPAB,EPAB,DWPI	l12 not l10	26	L13
JPAB,EPAB,DWPI	l8 and recombinant	34	L12
JPAB,EPAB,DWPI	propanediol and plasmid	1	L11
JPAB,EPAB,DWPI	(diol or glycerol) near2 (dehydrase or dehydratase)	21	L10
JPAB,EPAB,DWPI	dha$5 and propanediol	1	L9
JPAB,EPAB,DWPI	dha$5 or propanediol	5534	L8
USPT	(diol or glycerol) near2 (dehydrase or dehydratase)	27	L7
USPT	(l3 same l2) not l5	3	L6
USPT	l3 with l2	9	L5
USPT	l1 and (l2 or l3)	26	L4
USPT	propanediol	17930	L3
USPT	dha$5	4012	L2
USPT	((435/158)!.CCLS.)	111	L1

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(diol or glycerol) near2 (dehydrase or dehydratase)	0

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Today's Date: 1/26/2002

DB Name	Query	Hit Count	Set Name
USOC	(diol or glycerol) near2 (dehydrase or dehydratase)	0	L7
USOC	(l3 same l2) not l5	2	L6
USOC	l3 with l2	2	L5
USOC	l1 and (l2 or l3)	0	L4
USOC	propanediol	3470	L3
USOC	dha$5	20237	L2
USOC	((435/158)!.CCLS.)	21	L1

L7: Entry 2 of 27 File: USPT Oct 2, 2001

DOCUMENT-IDENTIFIER: US 6297428 B1
TITLE: Method for inducing viral resistance into a plant

DEPR:
The plasmid pET-P15 (harbouring the P15 nucleic acid sequence) was restricted at its single BamHI site and blunt-ended with T4 DNA polymerase. After purification by electrophoresis in 0.8% agarose gel, the linear plasmid was restricted at its single NcoI site. The P15 gene fragment of 400 bp was purified by electrophoresis and inserted into pMJBX-Ub (harbouring the Arabidopsis polyubiquitin promoter (Norris et al., Plant Molecular Biology 21, pp. 895-906 (1993), a TMV enhancer sequence and the Nos 3' terminator) cut with NcoI and SmaI restriction endonucleases. In the plasmid so obtained (pMJBX-Ub-P15), the nucleic acid sequence of the P15 gene is placed under the control of the Arabidopsis polyubiquitin promoter followed by the TMV enhancer sequence. The EcoRI fragment from plasmid pB235SAck contains the pat gene, used as the selective marker, encoding phosphinothricin acetyl transferase (obtained from Agrevo, Berlin Germany). On this EcoRI fragment, the nucleic acid sequence of the pat gene is under the control of the 5' and 3' expression signals of the Cauliflower virus. The plasmid pMJBS6, resulting from the combination of this EcoRI-pat fragment and a partial EcoRI digestion of plasmid pMJBX-Ub-P15, contains both the pat and the P15 genes. This pMJBS6 plasmid is a high-copy plasmid based on the pUC18 vector and contains also the -lactamase gene (amp.sup.r). In the plasmid pIGPD7, harbouring the same pat fragment as pB235SAck, the -lactamase gene was replaced by an igpd (imidazole glycerol phosphate dehydratase) gene from Saccharomyces cerevisiae (Struhl et al., Proceedings of the National Academy of Science USA 73, pp. 1471-1475 (1976). Selection for and maintenance of the plasmid in Escherichia coli was achieved by complementation of an auxotrophic hisB strain SB3930 on minimal medium in the absence of antibiotics. The P15 fragment, with its ubiquitin promoter and terminator sequence, was purified as a 2500 bp fragment obtained from the pMJBX-Ub-P15 plasmid after it was cut at the single HindIII site, followed by a partial EcoRI restriction. This fragment was blunt-ended and inserted in a blunt-ended pIGPD7 plasmid, cut at the single NcoI site. The resulting pIGPDS4 plasmid contains both the pat and the P15 genes on a vector without the .beta.-lactamase gene.

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L2: Entry 5 of 6 File: USPT Jan 11, 2000

US-PAT-NO: 6013494
DOCUMENT-IDENTIFIER: US 6013494 A

TITLE: Method for the production of 1,3-propanediol by recombinant microorganisms

DATE-ISSUED: January 11, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Nakamura; Charles E.	Claymont	DE		
Gatenby; Anthony A.	Wilmington	DE		
Hsu; Amy Kuang-Hua	Redwood City	CA		
La Reau; Richard D.	Mountain View	CA		
Haynie; Sharon L.	Philadelphia	PA		
Diaz-Torres; Maria	San Mateo	CA		
Trimbur; Donald E.	Redwood City	CA		
Whited; Gregory M.	Belmont	CA		
Nagarajan; Vasantha	Wilmington	DE		
Payne; Mark S.	Wilmington	DE		
Picataggio; Stephen K.	Landenberg	PA		
Nair; Ramesh V.	Wilmington	DE		

US-CL-CURRENT: 435/158; 435/252.3, 435/252.33, 435/254.21, 435/69.1

CLAIMS:

What is claimed is:
1. A method for the production of 1,3-propanediol from a recombinant microorganism comprising:
(i) transforming a suitable host microorganism with one or more transformation cassettes each of which comprises at least one of
(a) a gene encoding a glycerol-3-phosphate dehydrogenase activity;

(b) a gene encoding a glycerol-3-phosphatase activity;
(c) genes encoding a dehydratase activity; and
(d) a gene encoding 1,3-propanediol oxidoreductase activity, wherein all of the genes of (a)-(d) are introduced into the host microorganism;
(ii) culturing the transformed host microorganism under suitable conditions in the presence of at least one carbon source selected from the group consisting of monosaccharides, oligosaccharides, polysaccharides, or a one-carbon substrate whereby 1,3-propanediol

is produced; and
(iii) recovering the 1,3-propanediol.
2. The method of claim 1 wherein the suitable host microorganism is selected from the group consisting of bacteria, yeast, and filametous fungi.
3. The method of claim 2 wherein the suitable host microorganism is selected from the group of genera consisting of Citrobacter, Enterobacter, Clostridium, Klebsiella, Aerobacter, Lactobacillus, Aspergillus, Saccharomyces, Schizosaccharomyces, Zygosaccharomyces, Pichia, Kluyveromyces, Candida, Hansenula, Debaryomyces, Mucor, Torulopsis, Methylobacter, Escherichia, Salmonella, Bacillus, Streptomyces and Pseudomonas.
4. The method of claim 3 wherein the suitable host microorganism is selected from the group consisting of E. coli, Klebsiella spp., and Saccharomyces spp.
5. The method of claim 1 wherein the transformed host microorganism is a Klebsiella spp. transformed with a transformation cassette comprising the genes GPD1 and GPP2.
6. The method claim 1 wherein the carbon source is glucose.
7. The method of claim 1 wherein the gene encoding a glycerol-3-phosphate dehydrogenase activity is selected from the group consisting of
(a) an isolated nucleic acid molecule encoding the amino acid sequence set forth in SEQ ID NO:11, in SEQ ID NO:12, and in SEQ ID NO:13, or an enzymatically active fragment thereof;
(b) an isolated nucleic acid molecule that hybridizes with (a) under the following hybridization conditions: 0.1.times.SSC, 0.1% SDS at 65.degree. C.; and
(c) an isolated nucleic acid molecule that is completely complementary to (a) or (b).
8. The method of claim 1 wherein the gene encoding a glycerol-3-phosphatase activity is selected from the group consisting of
(a) an isolated nucleic acid molecule encoding the amino acid sequence set forth in SEQ ID NO:33 and in SEQ ID NO:17, or an enzymatically active fragment thereof;
(b) an isolated nucleic acid molecule that hybridizes with (a) under the following hybridization conditions: 0.1.times.SSC, 0.1% SDS at 65.degree. C.; and
(c) an isolated nucleic acid molecule that is completely complementary to (a) or (b).
9. The method of claim 1 wherein the gene encoding a glycerol-3-phosphatase activity is a glycerol kinase gene selected from the group consisting of
(a) an isolated nucleic acid molecule encoding the amino acid sequence set forth in SEQ ID NO:18, or an enzymatically active fragment thereof;
(b) an isolated nucleic acid molecule that hybridizes with (a) under the following hybridization conditions: 0.1.times.SSC, 0.1% SDS at 65.degree. C.; and(c) an isolated nucleic acid molecule that is completely complementary to (a) or (b).
10. The method of claim 1 wherein the genes encoding a dehydratase activity comprise dhaB1, dhaB2 and dhB3, and are selected from the group consisting of
(a) an isolated nucleic acid molecule encoding the amino acid sequence set forth in SEQ ID NO:34, SEQ ID NO:35, and SEQ ID NO:36, or an enzymatically active fragment thereof;

(b) an isolated nucleic acid molecule that hybridizes with (a) under the following hybridization conditions: 0.1.times.SSC, 0.1% SDS at 65.degree. C.; and(c) an isolated nucleic acid molecule that is completely complementary to (a) or (b).
11. The method of claim 1 wherein the gene encoding a 1,3-propanediol oxidoreductase activity selected from the group consisting of
(a) an isolated nucleic acid molecule encoding the amino acid sequence set forth in SEQ ID NO:37, or an enzymatically active fragment thereof;
(b) an isolated nucleic acid molecule that hybridizes with (a) under the following hybridization conditions: 0.1.times.SSC, 0.1% SDS at 65.degree. C.; and
(c) an isolated nucleic acid molecule that is completely complementary to (a) or (b).
12. A method for the production of 1,3-propanediol from a recombinant microorganism comprising:
(i) culturing, under suitable conditions in the presence of at least one carbon source selected from the group consisting of monosaccharides, oligosaccharides, polysaccharides, or a one-carbon substrate, a transformed host microorganism comprising
(a) a gene encoding a glycerol-3-phosphate dehydrogenase activity;

(b)a gene encoding a glycerol-3-phosphatase activity;
(c)genes encoding a dehydratase activity; and
(d) a gene encoding 1,3-propanediol oxidoreductase activity, wherein all of the genes (a)-(d) are exogenous to the host microorganism, whereby 1,3-propanediol is produced; and
(ii) recovering the 1,3-propanediol.
13. A host cell transformed with a group of genes comprising:
(1) a gene encoding a glycerol-3-phosphate dehydrogenase enzyme corresponding to the amino acid sequence given in SEQ ID NO:11;
(2) a gene encoding a glycerol-3-phosphatase enzyme corresponding to the amino acid sequence given in SEQ ID NO:17;
(3) a gene encoding the a subunit of the glycerol dehydratase enzyme corresponding to the amino acid sequence given in SEQ ID NO:34;
(4) a gene encoding the .beta. subunit of the glycerol dehydratase enzyme corresponding to the amino acid sequence given in SEQ ID NO:35;
(5) a gene encoding the .gamma. subunit of the glycerol dehydratase enzyme corresponding to the amino acid sequence given in SEQ ID NO:36; and
(6) a gene encoding the 1,3-propanediol oxidoreductase enzyme corresponding to the amino acid sequence given in SEQ ID NO:37, whereby the transformed host cell produces 1,3-propanediol on at least one substrate selected from the group consisting of monosaccharides, oligosaccharides, and polysaccharides or from a one-carbon substrate.

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L2: Entry 6 of 6 File: USPT Nov 11, 1997

US-PAT-NO: 5686276
DOCUMENT-IDENTIFIER: US 5686276 A

TITLE: Bioconversion of a fermentable carbon source to 1,3-propanediol by a single microorganism

DATE-ISSUED: November 11, 1997

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Laffend; Lisa Anne	Wilmington	DE		
Nagarajan; Vasantha	Wilmington	DE		
Nakamura; Charles Edwin	Claymont	DE		

US-CL-CURRENT: 435/158; 435/252.31, 435/252.33

CLAIMS:

What is claimed is:
1. A process comprising the bioconversion of a carbon substrate, other than glycerol or dihydroxyacetone, to 1,3-propanediol by a single microorganism having at least one gene that expresses a dehydratase enzyme by contacting said microorganism with said substrate.
2. The process of claim 1 wherein said microorganism has been genetically altered.
3. The process of claim 1 wherein the dehydratase enzyme is a glycerol dehydratase enzyme or a diol dehydratase enzyme.
4. The process of claim 1 wherein the microorganism is selected from the group consisting of members of the genera Citrobacter, Enterobacter, Clostridium, Klebsiella, Aerobacter, Lactobacillus, Aspergillus, Saccharomyces, Zygosaccharomyces, Pichia, Kluyveromyces, Candida, Hansenula, Debaryomyces, Mucor, Torulopsis, Methylobacteria, Escherichia, and Salmonella; recombinant microorganisms transformed with a gene encoding a glycerol dehydratase enzyme or a diol dehydratase enzyme; and mutants of microorganisms having phenotypes which enhance production of 1,3-propanediol.
5. The process of claim 4 wherein the microorganism is selected from the group consisting of members of the genera Klebsiella and Citrobacter, and recombinant Escherichia.
6. The process of claim 5 wherein the microorganism is recombinant E. coli.
7. The process of claim 1 wherein the carbon substrate is selected from the group consisting of compounds having at least a single

carbon atom, provided that the substrate is other than glycerol or dihydroxyacetone.
8. The process of claim 7 wherein the carbon substrate is selected from the group consisting of monosaccharides and oligosaccharides.

9. The process of claim 8 wherein the carbon substrate is glucose.

10. The process of claim 1 wherein the gene is a glycerol dehydratase gene isolated from the group consisting of members of the genera Klebsiella, Citrobacter, and Clostridium.
11. The process of claim 1 wherein the gene is a diol dehydratase gene isolated from the group consisting of members of the genera Klebsiella and Salmonella.
12. The process of claim 1 or 9 wherein the microorganism is E. coli containing a glycerol dehydratase gene from Klebsiella pneumoniae.
13. The process of claim 1 wherein the microorganism is grown in a medium prior to contacting it with the carbon substrate.
14. A process for the bioconversion of a carbon substrate to 1,3-propanediol by a single microorganism comprising:
(i) contacting a medium containing at least one carbon substrate with a single microorganism to yield a culture medium, wherein the at least one carbon substrate is selected from the group consisting of monosaccharides, oligosaccharides, and polysaccharides, provided that the carbon substrate is other than glycerol or dihydroxyacetone, and wherein said single microorganism is selected from the group consisting of members of the genera Klebsiella, Citrobacter, recombinant Escherichia, or is a recombinant organism transformed with a gene encoding a diol dehydratase enzyme or a glycerol dehydratase enzyme,
(ii) incubating said culture medium under suitable conditions to produce 1,3-propanediol; and
(iii) recovering said 1,3-propanediol.
15. The process of claim 14 wherein the at least one carbon substrate is glucose and wherein said single microorganism is a recombinant E. coli transformed with a gene encoding a diol dehydratase enzyme or a glycerol dehydratase enzyme.
16. The process of claim 1 further comprising recovering 1,3-propanediol following the bioconversion of the carbon substrate.

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L2: Entry 4 of 6 File: USPT Feb 15, 2000

US-PAT-NO: 6025184
DOCUMENT-IDENTIFIER: US 6025184 A

TITLE: Bioconversion of a fermentable carbon source to 1,3-propanediol by a single microorganism

DATE-ISSUED: February 15, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Laffend; Lisa Anne	Wilmington	DE		
Nagarajan; Vasantha	Wilmington	DE		
Nakamura; Charles Edwin	Claymont	DE		

US-CL-CURRENT: 435/252.33; 435/252.3, 435/320.1

CLAIMS:

What is claimed is:
1. A cosmid contained in ATCC 69789 comprising a DNA fragment of about 35 kb isolated from Klebsiella pneumoniae wherein 1) the DNA fragment encodes an active glycerol dehydratase enzyme and 2) digestion of the cosmid results in a restriction digest pattern as shown in FIG. 1, columns 1 and 2.
2. A host bacterium transformed with the cosmid of claim 1.
3. The host bacterium of claim 2 which is deposited with the American Type Culture Collection and having accession number ATCC 69789.
4. A host bacterium comprising the cosmid of claim 1, wherein at least one DNA fragment of said cosmid encodes 1,3-propanediol oxidoreductase, and wherein said host converts a carbon source, other than glycerol or dihydroxyacetone, to 1,3-propanediol.

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L1: Entry 2 of 3 File: USPT Oct 13, 1998

US-PAT-NO: 5821092
DOCUMENT-IDENTIFIER: US 5821092 A

TITLE: Production of 1,3-propanediol from glycerol by recombinant bacteria expressing recombinant diol dehydratase

DATE-ISSUED: October 13, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Nagarajan; Vasantha	Wilmington	DE		
Nakamura; Charles Edwin	Claymont	DE		

US-CL-CURRENT: 435/158; 435/232, 435/252.3, 435/252.31, 435/252.33, 435/252.35, 435/252.5, 435/252.7, 435/320.1, 536/23.1, 536/23.2, 536/23.7

CLAIMS:

What is claimed is:
1. A process for the bioconversion of a carbon substrate for diol dehydratase enzyme to the corresponding product comprising the steps of:
(i) transforming a microbial host with genes encoding an enzymatically active bacterial diol dehydratase enzyme, the genes derived from
(1) a cosmid, the cosmid comprising a DNA fragment of about 35 kb isolated from Klebsiella pneumoniae and contained within transformed E. coli deposited with the American Type Culture Collection under accession number ATCC 69790; or from
(2) enzymatically active diol dehydratase genes isolated from the group consisting of members of the species Klebsiella sp., Clostridia sp., Salmonella sp. and Citrobacter sp, one subunit of the genes and having at least a 95% identity to the nucleic acid sequence of SEQ ID NO:1;
(ii) contacting the transformed microbial host with the carbon substrate in a suitable medium; and
(iii) recovering the corresponding product from the suitable medium.
2. The process of claim 1 wherein the carbon substrate is selected from the group consisting of ethylene glycol, 1,2-propanediol, glycerol and 2,3-butanediol.
3. The process of claim 2 wherein the carbon substrate is glycerol.
4. The process of claim 3 wherein the glycerol is converted to 1,3-propanediol.

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L1: Entry 3 of 3 File: USPT May 27, 1997

US-PAT-NO: 5633362
DOCUMENT-IDENTIFIER: US 5633362 A

TITLE: Production of 1,3-propanediol from glycerol by recombinant bacteria expressing recombinant diol dehydratase

DATE-ISSUED: May 27, 1997

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Nagarajan; Vasantha	Wilmington	DE		
Nakamura; Charles E.	Claymont	DE		

US-CL-CURRENT: 536/23.1; 435/252.3, 435/252.33, 536/22.1, 536/24.3

CLAIMS:

What is claimed is:
1. A cosmid comprising a DNA fragment of about 35 kb isolated from Klebsiella pneumoniae wherein said fragment encodes an active diol dehydratase enzyme having the restriction digest in FIG. 5, columns numbered 4, said cosmid contained within a transformed E. coli deposited with the American Type Culture Collection under accession number ATCC 69790.
2. A transformed microorganism comprising a host microorganism and the cosmid of claim 1.
3. The transformed microorganism of claim 2 wherein the host microorganism is E. coli, and which is deposited with the American Type Culture Collection as accession number ATCC 69790.
4. The cosmid of claim 1 which when transformed into bacteria causes metabolism of glycerol to 1,3-propanediol.
5. A transformed microorganism comprising a host microorganism and a DNA fragment of the cosmid of claim 1, said fragment encoding an active functional protein.
6. A DNA fragment comprising a gene encoding a diol dehydratase enzyme, said gene encompassed by the cosmid of claim 1.
7. A isolated gene encoding an active diol dehydratase enzyme comprising a contiguous sequence which consists of SEQ ID NO: 1.
8. A isolated gene encoding an active alcohol dehydrogenase comprising a contiguous sequence which consists of SEQ ID NO: 2.
9. A transformed microorganism comprising a host microorganism and the heterologous gene of claim 7 or claim 8.
10. A transformed microorganism comprising E. coli DH5.alpha. and the DNA sequence of claim 7 or claim 8.

5. The process of claim 1 wherein the microbial host is selected from the group consisting of members of the genera Eschericia, Bacillus, Klebsiella, Citrobacter, Saccharomyces, Clostridium and Pichia.
6. The process of claim 5 wherein the microbial host is selected from the group consisting of members of species E. coli, Bacillus subtilis, Bacillus licheniformis and Pichia pastoris.
7. The process of claim 6 wherein the microbial host is E. coli.
8. The process of claim 1 wherein (a) the transformed microbial host is recombinant E. coli DH5.alpha. containing a gene encoding an enzymatically active diol dehydratase enzyme, the gene comprising the DNA sequence of SEQ ID NO. 1; (b) the carbon substrate is glycerol; and (c) the product recovered in step (iii) is 1,3-propanediol.
9. A process for the bioconversion of glycerol to 1,3-propanediol comprising the steps of:
(i) transforming a microbial host selected from the group consisting of the genera Eschericia, Bacillus, Klebsiella, Citrobacter, Saccharomyces, Clostridium and Pichia with genes encoding an enzymatically active bacterial diol dehydratase enzyme, the genes derived from a cosmid, the cosmid comprising a DNA fragment of about 35 kb isolated from Klebsiella pneumoniae, the cosmid contained within transformed E. coli deposited with the American Type Culture Collection under accession number ATCC 69790;
(ii) contacting the transformed microbial host with carbon substrate in a suitable medium; and
(iii) recovering 1,3-propanediol from a suitable medium.
10. The process of claims 8, 1 or 9 wherein the transformed microbial host further contains an alcohol dehydrogenase.

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L1 1240 S REGULON?
L2 2835 S DHA
L3 9 S L1 AND L2
L4 48660 S ANAEROB?
L5 55 S L1 AND L4
L6 16 S L2 AND L4
L7 115385 S FUNG?
L8 16 S L2 AND L7
L9 1604 S L2 NOT (DEHYDROACETIC OR DOCOSAHEX?)(W)ACID
L10 3 S L9 AND L7
L11 94629 S ASPERGILLUS OR SACCHAROMYCES OR YGOSACCHAROMYCES OR PIC
L12 479 S ZYGOSACCHAROMYCES
L13 136606 S DEBARYOMYCES OR MUCOR OR TORULOPSIS OR METHYLOBACTER OR
L14 222716 S L11 OR L12 OR L13
L15 32 S L9 AND L14
L16 219 S 504-63-2P/IT
L17 8 S L14 AND L16

L3 ANSWER 1 OF 9 CAPLUS COPYRIGHT 1998 ACS
TI Bioconversion of a fermentable carbon source to 1,3-propanediol by a single microorganism expressing a foreign glycerol or diol dehydratase gene

L3 ANSWER 2 OF 9 CAPLUS COPYRIGHT 1998 ACS
TI Phenotypic diversity of anaerobic glycerol dissimilation shown by seven enterobacterial species

L3 ANSWER 3 OF 9 CAPLUS COPYRIGHT 1998 ACS
TI Growth temperature-dependent activity of glycerol dehydratase in Escherichia coli expressing the Citrobacter freundii "dha" "regulon"

L3 ANSWER 4 OF 9 CAPLUS COPYRIGHT 1998 ACS
TI Enhancement of 1,3-propanediol production by cofermentation in Escherichia coli expressing Klebsiella pneumoniae "dha" "regulon" genes

L3 ANSWER 5 OF 9 CAPLUS COPYRIGHT 1998 ACS
TI 1,3-Propanediol production by Escherichia coli expressing genes from the Klebsiella pneumoniae "dha" "regulon"

L3 ANSWER 6 OF 9 CAPLUS COPYRIGHT 1998 ACS
TI Anaerobic growth of Escherichia coli on glycerol by importing genes of the "dha" "regulon" from Klebsiella pneumoniae

L3 ANSWER 7 OF 9 CAPLUS COPYRIGHT 1998 ACS
TI Klebsiella pneumoniae 1,3-propanediol:NAD+ oxidoreductase

L3 ANSWER 8 OF 9 CAPLUS COPYRIGHT 1998 ACS
TI Purification and properties of dihydroxyacetone kinase from Klebsiella pneumoniae

L3 ANSWER 9 OF 9 CAPLUS COPYRIGHT 1998 ACS
TI "dha" System mediating aerobic and anaerobic dissimilation of glycerol in Klebsiella pneumoniae NCIB 418

L5 ANSWER 1 OF 55 CAPLUS COPYRIGHT 1998 ACS
TI Mechanism of regulation of 8-hydroxyguanine endonuclease by oxidative stress: roles of FNR, ArcA, and Fur

L5 ANSWER 2 OF 55 CAPLUS COPYRIGHT 1998 ACS
TI The molecular basis for the differential regulation of the hlyE-encoded hemolysin of Escherichia coli by FNR and HlyX lies in the improved activating region 1 contact of HlyX

L5 ANSWER 3 OF 55 CAPLUS COPYRIGHT 1998 ACS
TI "Anaerobic" expression of the Photobacterium fischeri lux "regulon" requires the FNR protein which acts upon the left operon

L5 ANSWER 4 OF 55 CAPLUS COPYRIGHT 1998 ACS
TI A promoter and "regulon" specific to the storage organ of sugar beet but that is not regulated by environmental conditions

L5 ANSWER 5 OF 55 CAPLUS COPYRIGHT 1998 ACS
TI HlyX, the FNR homolog of Actinobacillus pleuropneumoniae, is a [4Fe-4S]-containing oxygen-responsive transcription regulator that "anaerobically" activated FNR-dependent Class I promoters via an enhanced AR1 contact

L5 ANSWER 6 OF 55 CAPLUS COPYRIGHT 1998 ACS
TI The DAN1 gene of S. cerevisiae is regulated in parallel with the hypoxic genes, but by a different mechanism

L5 ANSWER 7 OF 55 CAPLUS COPYRIGHT 1998 ACS
TI Study of redox-regulated transcription factors in prokaryotes

L5 ANSWER 8 OF 55 CAPLUS COPYRIGHT 1998 ACS
TI "Anaerobic" expression of the Vibrio fischeri lux "regulon" in E. coli is FNR-dependent

L5 ANSWER 9 OF 55 CAPLUS COPYRIGHT 1998 ACS
TI Methylphosphonic acid degradation and its physiological regulation in Escherichia coli

L5 ANSWER 10 OF 55 CAPLUS COPYRIGHT 1998 ACS
TI SoxR, a [2Fe-2S] transcription factor, is active only in its oxidized form

L5 ANSWER 11 OF 55 CAPLUS COPYRIGHT 1998 ACS
TI Transcriptional regulation of the Escherichia coli rhaT gene

L5 ANSWER 12 OF 55 CAPLUS COPYRIGHT 1998 ACS
TI Three two-component signal-transduction systems interact for Pho regulation in Bacillus subtilis

L5 ANSWER 13 OF 55 CAPLUS COPYRIGHT 1998 ACS
TI Functional significance of the Cu,ZnSOD in Escherichia coli

L5 ANSWER 14 OF 55 CAPLUS COPYRIGHT 1998 ACS
TI The complex bet promoters of Escherichia coli: regulation by oxygen (ArcA) choline (BetI), and osmotic stress

L5 ANSWER 15 OF 55 CAPLUS COPYRIGHT 1998 ACS
TI Regulators of aerobic and "anaerobic" respiration in Bacillus subtilis

L5 ANSWER 16 OF 55 CAPLUS COPYRIGHT 1998 ACS
TI A global signal transduction system regulates aerobic and "anaerobic" CO2 fixation in Rhodobacter sphaeroides

L5 ANSWER 17 OF 55 CAPLUS COPYRIGHT 1998 ACS
TI Regulation of "anaerobic" citrate metabolism in Klebsiella pneumoniae

L5 ANSWER 18 OF 55 CAPLUS COPYRIGHT 1998 ACS
TI Glutathione is required for maximal transcription of the cobalamin biosynthetic and 1,2-propanediol utilization (cob/pdu) "regulon" and for the catabolism of ethanolamine, 1,2-propanediol, and propionate in Salmonella typhimurium LT2

L5 ANSWER 19 OF 55 CAPLUS COPYRIGHT 1998 ACS
TI Roles of nitric oxide in inducible resistance of Escherichia coli to activated murine macrophages

L5 ANSWER 20 OF 55 CAPLUS COPYRIGHT 1998 ACS
TI Aerobic- ""anaerobic" gene regulation in Escherichia coli: control by the ArcAB and Fnr "regulons"

L5 ANSWER 21 OF 55 CAPLUS COPYRIGHT 1998 ACS
TI The control region of the pdu/cob "regulon" in Salmonella typhimurium

L5 ANSWER 22 OF 55 CAPLUS COPYRIGHT 1998 ACS
TI Phenotypic diversity of "anaerobic" glycerol dissimilation shown by seven enterobacterial species

L5 ANSWER 23 OF 55 CAPLUS COPYRIGHT 1998 ACS
TI Two global regulatory systems (Crp and Arc) control the cobalamin/propanediol "regulon" of Salmonella typhimurium

L5 ANSWER 24 OF 55 CAPLUS COPYRIGHT 1998 ACS
TI Control and function of lysyl-tRNA synthetases: Diversity and co-ordination

L5 ANSWER 25 OF 55 CAPLUS COPYRIGHT 1998 ACS
TI Hyperbaric sensitization of microbes to oxidative stress and disinfection

L5 ANSWER 26 OF 55 CAPLUS COPYRIGHT 1998 ACS
TI Choline transport activity in Staphylococcus aureus induced by osmotic stress and low phosphate concentrations

L5 ANSWER 27 OF 55 CAPLUS COPYRIGHT 1998 ACS

TI Induction of manganese-containing superoxide dismutase in *anaerobic* Escherichia coli by diamide and 1,10-phenanthroline: Sites of transcriptional regulation

L5 ANSWER 28 OF 55 CAPLUS COPYRIGHT 1998 ACS
TI Expression of extracellular phospholipase from Serratia liquefaciens is growth-phase dependent, catabolite-repressed and regulated by *anaerobiosis*

L5 ANSWER 29 OF 55 CAPLUS COPYRIGHT 1998 ACS
TI Genetic structure and regulation of the cysG gene in Salmonella typhimurium

L5 ANSWER 30 OF 55 CAPLUS COPYRIGHT 1998 ACS
TI Surface protein-CAT reporter fusions demonstrate differential gene expression in the vir *regulon* of Streptococcus pyogenes

L5 ANSWER 31 OF 55 CAPLUS COPYRIGHT 1998 ACS
TI Regulatory roles of Fnr, Fur, and Arc in expression of manganese-containing superoxide dismutase in Escherichia coli

L5 ANSWER 32 OF 55 CAPLUS COPYRIGHT 1998 ACS
TI A single regulatory gene integrates control of vitamin B12 synthesis and propanediol degradation

L5 ANSWER 33 OF 55 CAPLUS COPYRIGHT 1998 ACS
TI *Anaerobic* induction of the alkylation-inducible Escherichia coli aidB gene involves genes of the cysteine biosynthetic pathway

L5 ANSWER 34 OF 55 CAPLUS COPYRIGHT 1998 ACS
TI 1,3-Propanediol production by Escherichia coli expressing genes from the Klebsiella pneumoniae dha *regulon*

L5 ANSWER 35 OF 55 CAPLUS COPYRIGHT 1998 ACS
TI Adaptation of Escherichia coli to respiratory conditions: regulation of gene expression

L5 ANSWER 36 OF 55 CAPLUS COPYRIGHT 1998 ACS
TI A superoxide response *regulon* in Escherichia coli

L5 ANSWER 37 OF 55 CAPLUS COPYRIGHT 1998 ACS
TI The arcB gene of Escherichia coli encodes a sensor-regulator protein for *anaerobic* repression of the arc modulon

L5 ANSWER 38 OF 55 CAPLUS COPYRIGHT 1998 ACS
TI Substitution of 2 base pairs (1 base pair per DNA half-site) within the Escherichia coli lac promoter DNA site for catabolite gene activator protein places the lac promoter in the FNR *regulon*

L5 ANSWER 39 OF 55 CAPLUS COPYRIGHT 1998 ACS
TI Identification of phosphate starvation-inducible genes in Escherichia coli K-12 by DNA sequence analysis of psi::lacZ(Mu d1) transcriptional fusions

L5 ANSWER 40 OF 55 CAPLUS COPYRIGHT 1998 ACS
TI Multiple regulatory elements for the glpA operon encoding *anaerobic* glycerol-3-phosphate dehydrogenase and the glpD operon encoding aerobic glycerol-3-phosphate dehydrogenase in Escherichia coli: further characterization of respiratory control

L5 ANSWER 41 OF 55 CAPLUS COPYRIGHT 1998 ACS
TI *Anaerobic* growth of Escherichia coli on glycerol by importing genes of the dha *regulon* from Klebsiella pneumoniae

L5 ANSWER 42 OF 55 CAPLUS COPYRIGHT 1998 ACS
TI arcA (dye), a global regulatory gene in Escherichia coli mediating repression of enzymes in aerobic pathways

L5 ANSWER 43 OF 55 CAPLUS COPYRIGHT 1998 ACS
TI Induction of the manganese-containing superoxide dismutase in Escherichia coli is independent of the oxidative stress (oxyR-controlled) *regulon*

L5 ANSWER 44 OF 55 CAPLUS COPYRIGHT 1998 ACS
TI Transcriptional regulation of katE in Escherichia coli K-12

L5 ANSWER 45 OF 55 CAPLUS COPYRIGHT 1998 ACS
TI A mutant crp allele that differentially activates the operons of the fuc *regulon* in Escherichia coli

L5 ANSWER 46 OF 55 CAPLUS COPYRIGHT 1998 ACS
TI Cross-induction of the L-fucose system by L-rhamnose in Escherichia coli

L5 ANSWER 47 OF 55 CAPLUS COPYRIGHT 1998 ACS
TI Klebsiella pneumoniae 1,3-propanediol:NAD+ oxidoreductase

L5 ANSWER 48 OF 55 CAPLUS COPYRIGHT 1998 ACS
TI Loss of aldehyde dehydrogenase in an Escherichia coli mutant selected for growth on the rare sugar L-galactose

L5 ANSWER 49 OF 55 CAPLUS COPYRIGHT 1998 ACS
TI Oxygen regulation in Salmonella typhimurium

L5 ANSWER 50 OF 55 CAPLUS COPYRIGHT 1998 ACS
TI Overlapping and separate controls on the phosphate *regulon* in Escherichia coli K12

L5 ANSWER 51 OF 55 CAPLUS COPYRIGHT 1998 ACS
TI dha System mediating aerobic and *anaerobic* dissimilation of glycerol in Klebsiella pneumoniae NCIB 418

L5 ANSWER 52 OF 55 CAPLUS COPYRIGHT 1998 ACS
TI Synthesis of L-cysteine in Salmonella typhimurium

L5 ANSWER 53 OF 55 CAPLUS COPYRIGHT 1998 ACS
TI Gene-product relationships of the nif *regulon* of Klebsiella pneumoniae

L5 ANSWER 54 OF 55 CAPLUS COPYRIGHT 1998 ACS
TI Three kinds of controls affecting the expression of the glp *regulon* in Escherichia coli

L5 ANSWER 55 OF 55 CAPLUS COPYRIGHT 1998 ACS
TI *Anaerobic* L-.alpha.-glycerophosphate dehydrogenase of Escherichia coli. Its genetic locus and its physiological role

L6 ANSWER 1 OF 16 CAPLUS COPYRIGHT 1998 ACS
TI Kinetic study of the oxidation of ascorbic acid by aqueous copper(II) catalyzed by chloride ion

L6 ANSWER 2 OF 16 CAPLUS COPYRIGHT 1998 ACS
TI Phenotypic diversity of *anaerobic* glycerol dissimilation shown by seven enterobacterial species

L6 ANSWER 3 OF 16 CAPLUS COPYRIGHT 1998 ACS
TI Production of docosahexaenoic acid by marine bacteria isolated from deep sea fish

L6 ANSWER 4 OF 16 CAPLUS COPYRIGHT 1998 ACS
TI Specific nutrient transformation processes and change in dehydrogenase activity during formation and evolution of marine detrital microzone

L6 ANSWER 5 OF 16 CAPLUS COPYRIGHT 1998 ACS
TI *Anaerobic* dihydroxyacetone production from formaldehyde by methanotrophic bacteria

L6 ANSWER 6 OF 16 CAPLUS COPYRIGHT 1998 ACS
TI 1,3-Propanediol production by Escherichia coli expressing genes from the Klebsiella pneumoniae *dha* regulon

L6 ANSWER 7 OF 16 CAPLUS COPYRIGHT 1998 ACS
TI Correlations between TTC-dehydrogenase activity and other active parameters during aerobic digestion of excess activated sludge

L6 ANSWER 8 OF 16 CAPLUS COPYRIGHT 1998 ACS
TI Microbial enzyme activities: potential use for monitoring decomposition processes

L6 ANSWER 9 OF 16 CAPLUS COPYRIGHT 1998 ACS
TI *Anaerobic* growth of Escherichia coli on glycerol by importing genes of the *dha* regulon from Klebsiella pneumoniae

L6 ANSWER 10 OF 16 CAPLUS COPYRIGHT 1998 ACS
TI Microbial activity measurements for *anaerobic* sludge digestion

L6 ANSWER 11 OF 16 CAPLUS COPYRIGHT 1998 ACS
TI Klebsiella pneumoniae 1,3-propanediol:NAD+ oxidoreductase

L6 ANSWER 12 OF 16 CAPLUS COPYRIGHT 1998 ACS
TI Immunochemical properties of NAD+-linked glycerol dehydrogenases from Escherichia coli and Klebsiella pneumoniae

L6 ANSWER 13 OF 16 CAPLUS COPYRIGHT 1998 ACS
TI *dha* System mediating aerobic and *anaerobic* dissimilation of glycerol in Klebsiella pneumoniae NCIB 418

L6 ANSWER 14 OF 16 CAPLUS COPYRIGHT 1998 ACS
TI Glycerol fermentation in Klebsiella pneumoniae: functions of the coenzyme B12-dependent glycerol and diol dehydratases

L6 ANSWER 15 OF 16 CAPLUS COPYRIGHT 1998 ACS
TI Effects of storage temperature and duration on total vitamin C content of canned single-strength grapefruit juice

L6 ANSWER 16 OF 16 CAPLUS COPYRIGHT 1998 ACS
TI Regulation of glycerol catabolism in Klebsiella aerogenes

L6 ANSWER 7 OF 16 CAPLUS COPYRIGHT 1998 ACS
AB During aerobic digestion of excess activated sludge, 2,3,5-triphenyltetrazolium chloride-dehydrogenase activity (TTC-"DHA") is significantly correlated to other activity parameters including O uptake rate, microorganism population no., and mixed liquor suspended solid concn.. . .
IT Wastewater treatment (activated-sludge process, excess sludge "anaerobic" digestion in, TTC-dehydrogenase activity in)
IT 9082-29-5 RL: PRP (Properties) (activity of, in excess activated sludge "anaerobic" digestion, other activity parameters relation to)

L6 ANSWER 16 OF 16 CAPLUS COPYRIGHT 1998 ACS
AB . . . of glycerol as a C source for growth by K. aerogenes strain 2103 involved sep. aerobic (sn-glycerol 3-phosphate [G3P]) and "anaerobic" (dihydroxyacetone [***DHA"]) pathways of catabolism. Enzyme and transport activities of the aerobic pathway were elevated in cells grown under oxygenated conditions on glycerol or G3P. "Anaerobic" growth on G3P required the presence of an exogenous H acceptor such as fumarate; cells thus grown were highly inducedin the G3P pathway. "Anaerobic" growth on glycerol required no exogenous H acceptors; cells thus grown were highly induced in the "DHA" pathway but uninduced in the G3P pathway. The addn. of fumarate electron acceptors did not affect the relative levels of the 2 pathways. When both glycerol and G3P were provided "anaerobically" with fumarate, the "DHA" pathway was preferentially induced, which probably accounts for the exclusive utilization of glycerol until its exhaustion. The presence of a regulatory control of the G3P pathway imposed by the operation of the "DHA" pathway was suggested.
IT Carbon metabolic pathway (for glycerol catabolism, regulation of aerobic and "anaerobic" pathways in Klebsiella aerogenes in)
IT Klebsiella aerogenes (glycerol catabolism by, regulation of aerobic and "anaerobic" pathways in)
IT 56-81-5, biological studies RL: BPR (Biological process); BIOL (Biological study); PROC (Process) (metab. of, regulation of aerobic and "anaerobic" pathways in Klebsiella aerogenes for)

L8 ANSWER 1 OF 16 CAPLUS COPYRIGHT 1998 ACS
TI Evaluation of single cell sources of docosahexaenoic acid and arachidonic acid: a 4-week oral safety study in rats

L8 ANSWER 2 OF 16 CAPLUS COPYRIGHT 1998 ACS
TI Polyunsaturated fatty acids production by microbial cultivation

L8 ANSWER 3 OF 16 CAPLUS COPYRIGHT 1998 ACS
TI Effects of initial sugar concentration and nitrogen sources on the characteristics of growth and fermentation of "fungus" Thraustochytrium aureum ATCC 34304

L8 ANSWER 4 OF 16 CAPLUS COPYRIGHT 1998 ACS
TI Molecular cloning, sequence analysis, and functional characterization of the gene kdsA, encoding 3-deoxy-D-manno-2- octulosonate-8-phosphate synthase of Chlamydia psittaci 6BC

L8 ANSWER 5 OF 16 CAPLUS COPYRIGHT 1998 ACS
TI Plasma fatty acid responses, metabolic effects, and safety of microalgal and "fungal" oils rich in arachidonic and docosahexaenoic acids in healthy adults

L8 ANSWER 6 OF 16 CAPLUS COPYRIGHT 1998 ACS
TI Improvement of docosahexaenoic acid production in a culture of Thraustochytrium aureum by medium optimization

L8 ANSWER 7 OF 16 CAPLUS COPYRIGHT 1998 ACS
TI Microbial oils containing arachidonic and docosahexaenoic acids for treating neurological disorders

L8 ANSWER 8 OF 16 CAPLUS COPYRIGHT 1998 ACS
TI Dehydroacetic acid and the newly synthesized Schiff base to control aflatoxin accumulation

L8 ANSWER 9 OF 16 CAPLUS COPYRIGHT 1998 ACS
TI Concentration of eicosapentaenoic acid and docosahexaenoic acid in an arachidonic acid-producing "fungus" , Mortierella alpina 1S-4, grown with fish oil

L8 ANSWER 10 OF 16 CAPLUS COPYRIGHT 1998 ACS
TI Microbial omega-3-containing fats and oils for food use

L8 ANSWER 11 OF 16 CAPLUS COPYRIGHT 1998 ACS
TI Lipids of selected molds grown for production of n-3 and n-6 polyunsaturated fatty acids

L8 ANSWER 12 OF 16 CAPLUS COPYRIGHT 1998 ACS
TI Production of docosahexaenoic acid by Thraustochytrium aureum

L8 ANSWER 13 OF 16 CAPLUS COPYRIGHT 1998 ACS
TI Application of a specificity of Mucor miehei lipase to concentrate docosahexaenoic acid (***DHA")

L8 ANSWER 14 OF 16 CAPLUS COPYRIGHT 1998 ACS
TI Antimycotic activity effect of dehydroacetic acid (***DHA") in food

L8 ANSWER 15 OF 16 CAPLUS COPYRIGHT 1998 ACS
TI Side-effects of agrochemicals on soil microorganisms

L8 ANSWER 16 OF 16 CAPLUS COPYRIGHT 1998 ACS
TI Soft drinks. IV. Preservatives in soft drinks. 3. Transformation of "DHA" [dehydroacetic acid] in citric acid solution on heating and the inhibitory effect on Aspergillus niger

L10 ANSWER 1 OF 3 CAPLUS COPYRIGHT 1998 ACS
TI Polyunsaturated fatty acids production by microbial cultivation

L10 ANSWER 2 OF 3 CAPLUS COPYRIGHT 1998 ACS
TI Molecular cloning, sequence analysis, and functional characterization of the gene kdsA, encoding 3-deoxy-D-manno-2- octulosonate-8-phosphate synthase of Chlamydia psittaci 6BC

L10 ANSWER 3 OF 3 CAPLUS COPYRIGHT 1998 ACS
TI Side-effects of agrochemicals on soil microorganisms

L15 ANSWER 1 OF 32 CAPLUS COPYRIGHT 1998 ACS
TI Method for manufacture of eicosapentaenoic acid lower alkyl esters from ester mixtures including hydrolysis with lipase

L15 ANSWER 2 OF 32 CAPLUS COPYRIGHT 1998 ACS
TI Composition based on fish oil and containing high levels of polyunsaturated fatty acids and high oxidative stability

L15 ANSWER 3 OF 32 CAPLUS COPYRIGHT 1998 ACS
TI Novel transferable .beta.-lactam resistance with cephalosporinase characteristics in "Salmonella" enteritidis

L15 ANSWER 4 OF 32 CAPLUS COPYRIGHT 1998 ACS
TI Composting of effluent from a new two-phases centrifuge olive mill. Microbial characterization of the compost

L15 ANSWER 5 OF 32 CAPLUS COPYRIGHT 1998 ACS
TI Evidence from whole-sediment, porewater, and elutriate testing in toxicity assessment of contaminated sediments

L15 ANSWER 6 OF 32 CAPLUS COPYRIGHT 1998 ACS
TI Molecular cloning, sequence analysis, and functional characterization of the gene kdsA, encoding 3-deoxy-D-manno-2- octulosonate-8-phosphate synthase of Chlamydia psittaci 6BC

L15 ANSWER 7 OF 32 CAPLUS COPYRIGHT 1998 ACS
TI Bioconversion of a fermentable carbon source to 1,3-propanediol by a single microorganism expressing a foreign glycerol or diol dehydratase gene

L15 ANSWER 8 OF 32 CAPLUS COPYRIGHT 1998 ACS
TI Biosynthesis of pyochelin and dihydroaeruginoic acid requires the iron-regulated pchDCBA operon in "Pseudomonas" aeruginosa

L15 ANSWER 9 OF 32 CAPLUS COPYRIGHT 1998 ACS
TI Bacterial photomutagenicity testing: Distinction between direct, enzyme-mediated and light-induced events

L15 ANSWER 10 OF 32 CAPLUS COPYRIGHT 1998 ACS
TI Bioavailability and biodegradation rate of DDT by "Bacillus" sp. B75 in the presence of dissolved humic substances

L15 ANSWER 11 OF 32 CAPLUS COPYRIGHT 1998 ACS
TI Biosynthetic pathways of glycerol accumulation under salt stress in "Aspergillus" nidulans

L15 ANSWER 12 OF 32 CAPLUS COPYRIGHT 1998 ACS
TI Manufacture of stable and odorless powdered oils and fats

L15 ANSWER 13 OF 32 CAPLUS COPYRIGHT 1998 ACS
TI Synthesis of novel phosphatidyldihydroxyacetone via transphosphatidylation reaction by phospholipase D

L15 ANSWER 14 OF 32 CAPLUS COPYRIGHT 1998 ACS
TI Enrichment of polyunsaturated fatty acids with Geotrichum candidum lipase

L15 ANSWER 15 OF 32 CAPLUS COPYRIGHT 1998 ACS
TI Studies on the inactivation of N-methyl-N'-nitro-N-nitrosoguanidine by the addition of soluble vitamins and SH compounds

L15 ANSWER 16 OF 32 CAPLUS COPYRIGHT 1998 ACS
TI The antimicrobial effect of a structural variant of subtilin against outgrowing *Bacillus* cereus T spores and vegetative cells occurs by different mechanisms

L15 ANSWER 17 OF 32 CAPLUS COPYRIGHT 1998 ACS
TI Regulation of glycerol metabolism in *Zygosaccharomyces* rouxii in response to osmotic stress

L15 ANSWER 18 OF 32 CAPLUS COPYRIGHT 1998 ACS
TI Characterization of a glycerol kinase mutant of *Aspergillus* niger

L15 ANSWER 19 OF 32 CAPLUS COPYRIGHT 1998 ACS
TI Classical transketolase functions as the formaldehyde-assimilating enzyme during growth of a dihydroxyacetone synthase-negative mutant of the methylotrophic yeast *Hansenula* polymorpha on mixtures of xylose and methanol in continuous cultures

L15 ANSWER 20 OF 32 CAPLUS COPYRIGHT 1998 ACS
TI Metabolic regulation in the yeast *Hansenula* polymorpha. Growth of dihydroxyacetone kinase/glycerol kinase-negative mutants on mixtures of methanol and xylose in continuous cultures

L15 ANSWER 21 OF 32 CAPLUS COPYRIGHT 1998 ACS
TI Purification and properties of NADP+-dependent glycerol dehydrogenases from *Aspergillus* nidulans and A. niger

L15 ANSWER 22 OF 32 CAPLUS COPYRIGHT 1998 ACS
TI Methanol-dependent production of dihydroxyacetone and glycerol by mutants of the methylotrophic yeast *Hansenula* polymorpha blocked in dihydroxyacetone kinase and glycerol kinase

L15 ANSWER 23 OF 32 CAPLUS COPYRIGHT 1998 ACS
TI Genotoxicity of naturally occurring hydroxyanthraquinones

L15 ANSWER 24 OF 32 CAPLUS COPYRIGHT 1998 ACS
TI Dihydroxyacetone kinase from a methylotrophic yeast, *Hansenula* polymorpha CBS 4732. Purification, characterization and physiological role

L15 ANSWER 25 OF 32 CAPLUS COPYRIGHT 1998 ACS
TI Glycerol metabolism in the methylotrophic yeast *Hansenula* polymorpha: phosphorylation as the initial step

L15 ANSWER 26 OF 32 CAPLUS COPYRIGHT 1998 ACS
TI Dihydroxyacetone reductase of a methylotrophic yeast, *Hansenula* ofunaensis

L15 ANSWER 27 OF 32 CAPLUS COPYRIGHT 1998 ACS
TI Regulation of methanol metabolism in the yeast *Hansenula* polymorpha. Isolation and characterization of mutants blocked in methanol assimilatory enzymes

L15 ANSWER 28 OF 32 CAPLUS COPYRIGHT 1998 ACS
TI Effects of phospholipase C on the .beta.-receptor-adenylate cyclase system of chick erythrocyte membranes

L15 ANSWER 29 OF 32 CAPLUS COPYRIGHT 1998 ACS
TI In vitro and in vivo studies on the potential mutagenicity of alclofenac, dihydroxyalclofenac and alclofenac epoxide

L15 ANSWER 30 OF 32 CAPLUS COPYRIGHT 1998 ACS
TI A modified pulse-labeling technique for the detection of early intermediates in microbial metabolism: detection of [14C]-dihydroxyacetone during assimilation of [14C]-methanol by *Hansenula* polymorpha

L15 ANSWER 31 OF 32 CAPLUS COPYRIGHT 1998 ACS
TI Intermediates of antibiotics

L15 ANSWER 32 OF 32 CAPLUS COPYRIGHT 1998 ACS
TI Two mutants of glycerol metabolism in *Bacillus* subtilis

L15 ANSWER 11 OF 32 CAPLUS COPYRIGHT 1998 ACS
AN 1996:118929 CAPLUS DN 124:170433
TI Biosynthetic pathways of glycerol accumulation under salt stress in *Aspergillus* nidulans
AU Redkar, Rajendra J.; Locy, Robert D.; Singh, Narendra K.
CS Department of Botany and Microbiology, Auburn University, Auburn, AL, 36849-5407, USA
SO Exp. Mycol. (1995), Volume Date 1995, 19(4), 241-6 CODEN: EXMYD2; ISSN: 0147-5975 DT Journal LA English
AB A culture of *Aspergillus* nidulans (FGSC 359) was gradually adapted for growth in media contg. up to 2 M NaCl or was exposed to a salt shock with 2 M NaCl. The intracellular glycerol level increased by about 7.9-fold in salt-adapted and 2.4-fold in salt-shocked cultures when compared to the unadapted culture. The biosynthetic pathway involved in the accumulation of glycerol was investigated under long-term salt adaptation and short-term salt shock. Glycerol-3-phosphate dehydrogenase (EC 1.1.1.8) was induced 1.4-fold in salt-shocked but not in salt-adapted cultures. An alternate enzymic pathway involving glycerol dehydrogenase (NADP+-dependent) utilizing dihydroxyacetone (***DHA*) and/or DL-glyceraldehyde (DL-GAD) was induced by NaCl. *DHA* -dependent glycerol dehydrogenase activity was induced about 6.3-fold in salt-adapted and 1.35-fold in salt-shocked cultures, while DL-GAD-dependent activity was induced about 6.1-fold in salt-adapted and 1.2-fold in salt-shocked cultures. However, the level of glycerol dehydrogenase activity with DL-GAD as substrate was 7% of the *DHA* -dependent activity. We conclude that a salt-inducible NADP+-dependent glycerol dehydrogenase activity electrophoretically indistinguishable from previously described glycerol dehydrogenase I results in glycerol accumulation in salt-stressed A. nidulans.

L15 ANSWER 17 OF 32 CAPLUS COPYRIGHT 1998 ACS
AN 1992:55338 CAPLUS DN 116:55338
TI Regulation of glycerol metabolism in *Zygosaccharomyces* rouxii in response to osmotic stress
AU Van Zyl, Petrus Jakobus; Prior, Bernard Alexander; Kilian, Stephanus Gouws
CS Dep. Microbiol. Biochem., Univ. Orange Free State, Bloemfontein, 9300, S. Afr.
SO Appl. Microbiol. Biotechnol. (1991), 36(3), 369-74 CODEN: AMBIDG; ISSN: 0175-7598 DT Journal LA English
AB Enzyme anal. indicated that the metab. of glycerol by X. rouxii occurred via either glycerol 3-phosphate (G3P) or dihydroxyacetone (*DHA*). The route via *DHA* is significant in osmoregulation. The specific activities of glycerol dehydrogenase (GDHG) and *DHA* kinase, which metabolize glycerol via *DHA* , increased 9- and 4-fold, resp., during osmotic stress [0.960 water activity (aw) adjusted with NaCl] when compared to nonstressed conditions (0.998 aw). Both pathways are under metabolic regulation. Glycerol kinase, mitochondrial G3P dehydrogenase, and *DHA* kinase are induced by glycerol, while the latter is also repressed by glucose. Cells treated with cycloheximide prior to osmotic upshock showed significantly lower *DHA* kinase and GDHG levels and lower intracellular glycerol concns. than untreated control cells. Thus protein synthesis is essential for osmotic adaptation.

L15 ANSWER 18 OF 32 CAPLUS COPYRIGHT 1998 ACS
AN 1991:38939 CAPLUS DN 114:38939
TI Characterization of a glycerol kinase mutant of *Aspergillus* niger
AU Witteveen, Cor F. B.; Van de Vondervoort, Peter; Dijkema, Cor; Swart, Klaas; Visser, Jaap
CS Dep. Genet., Agric. Univ., Wageningen, 6703 HA, Neth.
LA English
AB A glycerol-kinase-deficient mutant of A. niger was isolated. Genetic anal. revealed that the mutation is located on linkage group VI. The phenotype of this mutant differed from that of a glycerol kinase mutant of A. nidulans in its ability to utilize dihydroxyacetone (***DHA*). The weak growth on glycerol of the A. niger glycerol kinase mutant showed that glycerol phosphorylation is an important step in glycerol catabolism. The mutant could still grow normally on *DHA* because of the presence of a *DHA* kinase. This enzyme, probably in combination with an NAD+-dependent glycerol dehydrogenase, present only in the mutant, is responsible for the weak growth of the mutant on glycerol. Enzymic anal. of both the mutant and the parental strain showed that .gtoreq.3 different glycerol dehydrogenases were formed under different physiol. conditions: the NAD+-dependent enzyme described above, a constitutive NADP+-dependent enzyme, and a D-glyceraldehyde-specific enzyme induced on D-galacturonate. The glycerol kinase mutant showed impaired growth on D-galacturonate.

L15 ANSWER 19 OF 32 CAPLUS COPYRIGHT 1998 ACS
AN 1990:474497 CAPLUS DN 113:74497
TI Classical transketolase functions as the formaldehyde-assimilating enzyme during growth of a dihydroxyacetone synthase-negative mutant of the methylotrophic yeast *Hansenula* polymorpha on mixtures of xylose and methanol in continuous cultures
AU De Koning, W.; Bonting, K.; Harder, W.; Dijkhuizen, L.
CS Dep. Microbiol., Univ. Groningen, Haren, 9751 NN, Neth.
SO Yeast (1990), 6(2), 117-25 CODEN: YESTE3; ISSN: 0749-503X DT Journal LA English
AB Contrary to expectation, a mutant of H. polymorpha blocked in dihydroxyacetone (***DHA*) synthase was able to assimilate methanol-carbon when grown in chemostat culture on mixts. of xylose and methanol. Incubation of a *DHA* synthase- and *DHA* kinase-neg. double mutant resulted in *DHA* accumulation, indicating that a *DHA* synthase-type of reaction was involved. Low residual *DHA* synthase activity subsequently was present when using an assay with improved sensitivity. This activity was not assocd. with the (mutated) *DHA* synthase protein, which was still present in the peroxisomes, but with the enzyme transketolase. Transketolase from methanol-grown cells was purified (525-fold) to homogeneity in 9% yield. The native enzyme was dimeric, as has been reported for other transketolases, with a subunit mol. wt. of 74,000. The affinity of the purified enzyme for formaldehyde was low (Km = 5 mM), but high for xylulose-5-phosphate (10 .mu.M). The in vivo functioning of transketolase in formaldehyde assimilation, and the influence of the hydration state of formaldehyde is discussed.

L15 ANSWER 20 OF 32 CAPLUS COPYRIGHT 1998 ACS
AN 1990:474496 CAPLUS DN 113:74496
TI Metabolic regulation in the yeast *Hansenula* polymorpha. Growth of dihydroxyacetone kinase/glycerol kinase-negative mutants on mixtures of methanol and xylose in continuous cultures
AU De Koning, W.; Weusthuis, R. A.; Harder, W.; Dijkhuizen, L.

CS Dep. Microbiol., Univ. Groningen, Haren, 9751 NN, Neth.
SO Yeast (1990), 6(2), 107-15 CODEN: YESTE3; ISSN: 0749-503X DT Journal LA English
AB The physiol. responses of H. polymorpha wild-type and mutant strains 17B (dihydroxyacetone kinase-neg.) and 17BG51 (dihydroxyacetone kinase- and glycerol kinase-neg.) to growth on mixts. of xylose and methanol in chemostats were investigated. Increasing methanol concns. (0-110 mM) in the feed of the wild-type culture resulted in increasing cell densities and a gradual switch towards methanol metab. At the lower methanol feed concns. the mutant cultures used methanol and xylose to completion and changes in enzyme patterns comparable to the wild type were obsd. This was not reflected in significant changes in cell densities. Instead, formaldehyde assimilation resulted in dihydroxyacetone (***DHA*) prodn., which was proportional to the amt. of methanol added. At intermediate methanol concns., the culture showed a strong variation in *DHA* levels and cell densities. Further increases in the methanol feed concns. resulted in a drop in *DHA* accumulation rates, repression of alc. oxidase synthesis, and accumulation of residual methanol. These phenomena were studied in more detail in transition expts. and with gradients of methanol. The results indicate that xylulose-5-phosphate (Xu5P) generated in xylose metab. served as acceptor mol. for formaldehyde assimilation by the peroxisomal enzyme *DHA* synthase. Accumulation of *DHA* in the mutant cultures, however, further diminished the availability of carbon for growth. Thus, with increasing methanol concns., Xu5P eventually became growth rate-limiting. This resulted in an unstable situation but wash-out of the culture did not occur to a significant extent. Instead, *DHA* accumulation ceases and cell densities, and the enzymes specifically involved in xylose metab. increase, indicating that the organism resumed its xylose metab. The mol. mechanism controlling the partitioning of Xu5P over xylose (pentose phosphate pathway) and methanol (peroxisome) metab. under these conditions remain to be elucidated.

L15 ANSWER 21 OF 32 CAPLUS COPYRIGHT 1998 ACS
AN 1990:454844 CAPLUS DN 113:54844
TI Purification and properties of NADP+-dependent glycerol dehydrogenases from *Aspergillus* nidulans and A. niger
AU Schuurink, R.; Busink, R.; Hondmann, D. H. A.; Witteveen, C. F. B.; Visser, J.
CS Dep. Genet., Agric. Univ., Wageningen, 6703 HA, Neth.
SO J. Gen. Microbiol. (1990), 136(6), 1043-50 CODEN: JGMIAN; ISSN: 0022-1287 DT Journal LA English
AB Glycerol dehydrogenase (NADP-specific; EC 1.1.1.72) (I) was purified from mycelium of A. nidulans and A. niger using different purifn. procedures. Both enzymes had a mol. wt. of .apprx.38,000 and were immunol. cross-reactive, but had different amino acid compns. and pI values. For both enzymes, the substrate specificity was limited to glycerol and erythritol for the oxidative reaction and to dihydroxyacetone (***DHA*), diacetyl, methylglyoxal, erythrose, and D-glyceraldehyde for the reductive reaction. I of A. nidulans had a turnover no. twice that of A. niger I at pH 6.0, whereas inhibition by NADP was less (Ki = 45 vs. 13 .mu.M). It was proposed that both enzymes catalyze in vivo the redn. of *DHA* to glycerol and that they are regulated by the anabolic redn. charge.

L15 ANSWER 22 OF 32 CAPLUS COPYRIGHT 1998 ACS
AN 1990:215157 CAPLUS DN 112:215157
TI Methanol-dependent production of dihydroxyacetone and glycerol by mutants of the methylotrophic yeast *Hansenula* polymorpha blocked in dihydroxyacetone kinase and glycerol kinase
AU De Koning, W.; Weusthuis, R. A.; Harder, W.; Dijkhuizen, L.
CS Dep. Microbiol., Univ. Groningen, Haren, NL-9751 NN, Neth.
SO Appl. Microbiol. Biotechnol. (1990), 32(6), 693-8 CODEN: AMBIDG; ISSN: 0175-7598 DT Journal LA English
AB Various factors controlling dihydroxyacetone (***DHA*) and glycerol prodn. from methanol by resting cell suspensions of a mutant of H. polymorpha, blocked in *DHA* kinase and glycerol kinase, were investigated. The presence of methanol (250 mM) and an addnl. substrate (0.5%, w/v) to replenish the xylulose-5-phosphate required for the assimilation reaction (DHQa synthase) was essential for significant triose prodn. by this double mutant. A no. of sugars were tested as addnl. substrates and C5 sugars gave the highest triose accumulation (ca. 20 mM after 45 h). Glucose was the poorest addnl. substrate and triose prodn. only started after its exhaustion, which occurred in the first few hours. Other sugars were metabolized at a much lower rate and accumulation of trioses began right at the start of the expts. and gradually increased with time. The prodn. rate of total trioses increased, and the relative amt. of glycerol diminished with higher oxygen supply rates. The data suggest that conversion of *DHA* into glycerol, catalyzed by reduced nicotine adenine dinucleotide (NADH)-dependent *DHA* reductase, is partly regulated via intracellular NADH levels. Further support for this hypothesis was obtained in expts. with antimycin A, an inhibitor of the electron transport chain. Addn. of higher amts. of methanol and xylose, either by increasing the initial concns. or by repeated addn. of these substrates, resulted in considerably enhanced productivity and a switch towards glycerol formation. After reaching a level of approx. 25 mM the *DHA* concn. remained const. while the glycerol level gradually increased with time. After an incubation period of 350 h, a total of 3.9 M methanol and 0.62 M xylose had been converted, which resulted in accumulation of 0.76 M trioses, mostly glycerol.

L15 ANSWER 25 OF 32 CAPLUS COPYRIGHT 1998 ACS
AN 1987:614645 CAPLUS DN 107:214645
TI Glycerol metabolism in the methylotrophic yeast *Hansenula* polymorpha: phosphorylation as the initial step
AU De Koning, W.; Harder, W.; Dijkhuizen, L.
CS Dep. Microbiol., Univ. Groningen, Haren, NL-9751 NN, Neth.
SO Arch. Microbiol. (1987), 148(4), 314-20 CODEN: AMICCW; ISSN: 0302-8933 DT Journal LA English
AB In H. polymorpha glycerol is metabolized via glycerol kinase and NAD(P)-independent glycerol 3-phosphate (G3P) dehydrogenase, enzymes which hitherto were reported to be absent in this methylotrophic yeast. Activity of glycerol kinase was readily detectable when cell-free exts. were incubated at pH 7-8 with glycerol, ATP, and Mg2+ and a discontinuous assay for G3P formation was used. This glycerol kinase activity could be sepd. from dihydroxyacetone (*DHA*) kinase activity by ion exchange chromatog. Glycerol kinase showed relatively low affinities for glycerol (apparent Km = 1.0 mM) and ATP (apparent Km = 0.5 mM) and was not active with other substrates tested. No inhibition by fructose 1,6-bisphosphate (FBP) was obsd. Both NAD-dependent and NAD(P)-independent G3P dehydrogenases were present. Glucose partly repressed synthesis of glycerol kinase and NAD(P)-independent G3P dehydrogenase, but compared to several other non-repressing C sources no clear induction of these enzymes by glycerol was apparent. Among glycerol-neg. mutants of H. polymorpha strain 17B (a *DHA* kinase-neg. mutant), strains blocked in either glycerol kinase or membrane-bound G3P dehydrogenase were identified. Crosses between representatives of the latter mutants and wild type resulted in the isolation of, among others, segregants which had regained *DHA* kinase but were still blocked in the membrane-bound G3P dehydrogenase. These strains, employing the oxidative pathway, were only able to grow very slowly in glycerol mineral medium.

L15 ANSWER 26 OF 32 CAPLUS COPYRIGHT 1998 ACS
AN 1987:613959 CAPLUS DN 107:213959
TI Dihydroxyacetone reductase of a methylotrophic yeast, *Hansenula* ofunaensis
AU Yamada, Keiko; Tani, Yoshiki
CS Fac. Agric., Kyoto Univ., Kyoto, 606, Japan
SO Agric. Biol. Chem. (1987), 51(9), 2629-31 CODEN: ABCHA6; ISSN: 0002-1369 DT Journal LA English
AB Dihydroxyacetone (***DHA*) reductase formation was induced by growing H. ofunaensis in MeOH-contg. media, and enzyme-substrate activity was tested. *DHA* reductase was isolated by applying cell-free ext. to a DEAE-cellulose column and eluting with KCl in buffer. Oxidative activity, in the presence of NAD+, was low toward glycerol (Km = 2.9 mM) and higher toward 1,2-propanediol and EtOH. The enzyme had reductive activity, in the presence of NADH+, toward *DHA* (Km = 0.36 mM), methylglyoxal, and acetol.

L15 ANSWER 32 OF 32 CAPLUS COPYRIGHT 1998 ACS
AN 1972:472470 CAPLUS DN 77:72470
TI Two mutants of glycerol metabolism in *Bacillus* subtilis
AU Saheb, S. A.
CS Serv. Physiol. Cellulaire, Inst. Pasteur, Paris, Fr.
SO Can. J. Microbiol. (1972), 18(8), 1315-25 CODEN: CJMIAZ DT Journal LA French
AB Two pathways for the degradation of glycerol are found in B. subtilis 168. Each pathway includes two enzymes which can catalyze the formation of dihydroxyacetone phosphate from glycerol in vitro. The first pathway includes a glycerol dehydrogenase (gl-D) and a dihydroxyacetone kinase (***dha* -K). The second pathway includes a glycerol kinase (gl-K) and an .alpha.-glycerophosphate dehydrogenase (glp-D). Enzymes of both pathways are repressed in the presence of glucose. Only the enzymes of the second pathway are inducible. The inducer is probably glycerophosphate, utilization of which as a C source by B. subtilis is demonstrated. Degradation of glycerol in B. subtilis proceeds through the second pathway. This was demonstrated by the isolation of a mutant (gl-2) impaired in glycerol kinase, and which cannot use glycerol as a C source. Another mutant (gl-1) was isolated, which cannot use glycerol as a C source. When comparing the activity of the four enzym particularly gl-K, no significant differences were observed between the wild strain and the mutant gl-1. This indicates the existence of a glycerol permeation system in B. subtilis. A mutation affecting this system would explain the behavior of the mutant gl-1.

L17 ANSWER 1 OF 8 CAPLUS COPYRIGHT 1998 ACS
TI Metabolic engineering of propanediol pathways

L17 ANSWER 2 OF 8 CAPLUS COPYRIGHT 1998 ACS
TI Metabolic engineering of an improved 1,3-propanediol fermentation (Klebsiella pneumoniae, *Bacillus* licheniformis)

L17 ANSWER 3 OF 8 CAPLUS COPYRIGHT 1998 ACS
TI Production of 1,3-propanediol from glycerol by recombinant bacteria expressing recombinant diol dehydratase

L17 ANSWER 4 OF 8 CAPLUS COPYRIGHT 1998 ACS
TI Bioconversion of a fermentable carbon source to 1,3-propanediol by a single microorganism expressing a foreign glycerol or diol dehydratase gene

L17 ANSWER 5 OF 8 CAPLUS COPYRIGHT 1998 ACS
TI Process for making 1,3-propanediol from carbohydrates using mixed microbial cultures

L17 ANSWER 6 OF 8 CAPLUS COPYRIGHT 1998 ACS
AN 1993:146193 CAPLUS DN 118:146193

TI Microbial production and downstream processing of 2,3-butanediol
AU Afschar, A. S.; Vaz Rossell, C. E.; Jonas, R.; Chanto, A. Quesada; Schaller, K.
CS GBF-Ges. Biotechnol. Forsch. mbH, Braunschweig, W-3300, Germany
SO J. Biotechnol. (1993), 27(3), 317-29 CODEN: JBITD4; ISSN: 0168-1656 DT Journal LA English
AB In the direct conversion of starch by *Bacillus* polymyxa a max. of 38 g 2,3-butanediol/L is produced, with a yield of 0.28 g diol/g starch. By preliminary saccharification of starch and then cultivation with Klebsiella oxytoca, a 2,3-butanediol concn. of 99-100 g/L is achieved with a yield of 0.5 g diol/g starch. K. oxytoca converts high-test molasses to 2,3-butanediol in the same concn. and yield. The same diol concn., only at lower productivity, can also be achieved by conversion of black strap molasses, provided it contains <2% salts. 2,3-Butanediol can be sepd. from bioprocess media with very good results by salting out using anhyd. K2CO3. After precleaning the medium from molasses or saccharified starch conversion process, it was possible to sep. 94-96% of the 2,3-butanediol using 53-56% K2CO3. The concn. of the 2,3-butanediol in the resulting diol phase was 97%. Salting out can also be used to sep. other diols produced using micobiol. methods.

L17 ANSWER 7 OF 8 CAPLUS COPYRIGHT 1998 ACS
AN 1990:234037 CAPLUS DN 112:234037
TI Fermentative manufacture of 1,3-propanediol from glycerol
IN Kretschmann, Josef; Carduck, Franz Josef; Deckwer, Wolf Dieter; Tag, Carmen
PA Henkel K.-G.a.A., Fed. Rep. Ger.; Gesellschaft fuer Biotechnologische Forschung m.b.H. (GBF)
SO Ger. Offen., 7 pp. CODEN: GWXXBX
PI DE 3829618 A1 900315 AI DE 88-3829618 880901 DT Patent LA German
AB Propane-1,3-diol is manufd. from a glycerol-contg. soln. (5-20% by wt.) with a microorganism such as Clostridium, Enterobacterium, Lactobacillus, *Bacillus* , Citrobacter, or Klebsiella in a yield of .gtoreq.0.5 g/h/L. Klebsiella pneumoniae DSM 2026 was batch-cultured at 37.degree. under anaerobic conditions to yield a max. of 2.3 g propane-1,3-diol from a starting glycerol concn. of 100 g/L; other glycerol concns. (50-200 g/L) produced lower yields.

L17 ANSWER 8 OF 8 CAPLUS COPYRIGHT 1998 ACS
AN 1983:214106 CAPLUS DN 98:214106
TI Neutral solvent production from halophilic, photolithotrophically grown algae by linked fermentations
AU Nakas, J. P.; Schaedle, M.; Parkinson, C. M.; Coonley, C. E.; Tanenbaum, S. W.
CS Coll. Environ. Sci. For., SUNY, Syracuse, NY, 13210, USA
SO Comm. Eur. Communities, [Rep.] EUR (1983), EUR 8245, Energy Biomass, 298-302 CODEN: CECED9 DT Report LA English
AB Five species of Dunaliella were examd. for glycerol [56-81-5] accumulation, growth rate, cell d., and protein and chlorophyll content. The suitability of each algal species for such bioconversions was judged according to glycerol accumulation and quantities of neutral solvents produced after sequential bacterial fermns. When grown in 2M NaCl, with 24 mM NaHCO3 or 3% CO2 at 28.degree., and with 25,000 lx at container surface, 4 of the 5 species tested (D. tertiolecta, D. primolecta, D. parva, and D. bardawil) produced 10-20 mg of glycerol/L. A Clostridium converted an algal biomass mixt. supplemented with 4% glycerol to .apprx.18 g/L of mixed alcs. (EtOH [64-17-5], 1,3-propanediol [504-63-2], and BuOH [71-36-3]). Acetone was not detected. A soil isolate, tentatively classified as a member of the genus *Bacillus* , converts glycerol into EtOH at a final concn. of 7.0-9.6 g/L. An enrichment culture from sewage sludge resolved to contain 2 gram-neg. rods converts the algal biomass-glycerol mixt. solely to 1,3-propanediol [504-63-2] at a final concn. of 4.2-5.3 g/L. Addnl., Dunaliella concs., of .ltoreq.200-fold, can be directly fermented to mixed solvents.

********** STN Columbus **********
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FILE 'BIOSIS' ENTERED AT 09:30:06 ON 22 JUN 1998
L1 45281 S SALMONELLA
L2 246 S SENFTENBERG
L3 236 S L1 AND L2
L4 28504 S GLYCEROL
L5 3679 S GLYCERIN
L6 1 S (L4 OR L5) AND L3
L7 331 S DERBY
L8 0 S L7 AND (L4 OR L5) AND L1
FILE 'MEDLINE' ENTERED AT 09:32:26 ON 22 JUN 1998
L9 3 S L6
L10 0 S L8
L11 85 S L3
L12 280 S ENTERICA
L13 1 L12 AND L11
L14 0 L7 AND L12
L15 68 L7 AND L1

L6 ANSWER 1 OF 1 BIOSIS COPYRIGHT 1998 BIOSIS
AN 93:96603 BIOSIS
DN BA95:51799
TI NOVOBIOCIN BRILLANT GREEN *GLYCEROL* LACTOSE AGAR FURTHER ROUTINE EVALUATION ON 5554 HUMAN STOOLS AND 982 VETERINARY SAMPLES.
AU POISSON D M; NUGIER J P; FLORENCE S; BELLAOUNI H
CS LAB. BACTERIOL. CHRO, BP 2439, 45032 ORLEANS CEDEX, FRANCE.
SO PATHOL BIOL 40 (8). 1992. 793-796. CODEN: PTBIAN ISSN: 0031-3009
LA English
AB In order to provide a wider evaluation of *Novobiocin-brillant green-*glycerol* -lactose* (NBGL) agar, dishes of this medium were added to standard media: Hektoen (H), *Salmonella* -Shigella agar (SS), at all plating steps for 5554 stool cultures of human medical routine (280 isolates) and 982 samples of veterinary routine (133 isolates). NBGL expectively missed lactose ***glycerol* positive strains of the serotype *Senftenberg* (n = 4), H2S negative strains (n = 1), and strains of the Typhi serotype (n = 7). Otherwise, three strains, of serotype Virchow, were unable to grow on NBGL (0.7% of positive samples). Nevertheless overall sensitivities were increased by .apprx. 10% in the human routine (H: 70%; SS : 63%; NBGL: 94%; at the direct plating step) (H: 83%; SS: 84%; NBGL: 92%; at the enrichment plating step) and by 48% in the veterinary one (NBGL: 97%; versus usual media: 68%). Positive predictive values of black centered colonies were significantly higher on NBGL in human routine (H: 38%; SS: 40%: NBGL: 89%; at the direct plating step) (H:20%; SS:21%; NBGL: 82%; at the enrichment plating step); and in the veterinary one as well (NBGL: 90%; versus usual media: 17%). These data suggest that NBGL agar does improve *Salmonella* isolation in these kinds of routines, and that growth should be made sure before experiments using given strains.
ST METHOD
RN 56-81-5 (GLYCEROL) 63-42-3 (LACTOSE) 303-81-1 (NOVOBIOCIN) 9002-18-0 (AGAR)
CC Biochemical Studies-Carbohydrates 10068 Pharmacology-General *22002 Microbiological Apparatus, Methods and Media *32000 Veterinary Science-Microbiology *38006 Chemotherapy-Antibacterial Agents *38504
BC Animalia-Unspecified 33000 Hominidae 86215

L9 ANSWER 1 OF 3 MEDLINE AN 95130176 MEDLINE DN 95130176
TI Development of a conjoint phage typing & biotyping schema for *Salmonella* enterica serovar *Senftenberg* (S. *senftenberg*) & the correlation of biotypes with phage types.
AU Kumar S; Sharma N C; Singh S; Bhatia R; Singh H
CS Department of Medical Microbiology, Postgraduate Institute of Medical Education & Research, Chandigarh..
SO INDIAN JOURNAL OF MEDICAL RESEARCH, (1994 Dec) 100 257-61. Journal code: GJF. ISSN: 0971-5916. CY I
DT Journal; Article; (JOURNAL ARTICLE) LA English EM 199504
AB A total of 287 strains of S. *senftenberg* received from various parts of India during 1969 to 1992 were phage typed using six lysogenic phages. The typability was 90.3 per cent and 14 different phage types could be defined excluding a small group of untypable strains. A biotyping scheme was developed utilising six characters and 13 biotypes could be defined. Stern's *glycerol* medium proved to be the best discriminatory medium. Diversity indeces of phage typing and biotyping schemes were 0.868 and 0.503 respectively. Better discrimination was obtained when phage types were subdivided into different biotypes with a diversity index of 0.931. The schemes were found stable, reproducible and epidemiologically useful.
CT *Bacterial Typing Techniques *Bacteriophage Typing Lysogeny **Salmonella: CL, classification* * Salmonella: VI, virology* * Salmonella Phages: PH, physiology*

L9 ANSWER 3 OF 3 MEDLINE AN 92160256 MEDLINE DN 92160256
TI Differentiation of *Salmonella* *senftenberg* into biogroups.
AU Tuchili L M; McLaren I M; Smith J E; Wray C
CS Central Veterinary Research Institute, Lusaka, Zambia..
SO VETERINARY RECORD, (1991 Dec 14) 129 (24) 530-1. Journal code: XBS. ISSN: 0042-4900. CY ENGLAND: United Kingdom
DT Journal; Article; (JOURNAL ARTICLE) LA English FS Priority Journals EM 199205
AB Ninety-six strains of *Salmonella* *senftenberg* , isolated between 1984 and 1986 from different parts of England and Wales, were tested for their biochemical reactions and biotyped according to the method of Duguid and others (1975). Nine biogroups were identified on the basis of their metabolism of L-tartrate, D-tartrate, Bitter's xylose and Stern's *glycerol* . In

addition, fumaric, oxalic, succinic, glutaric, malonic, maleic, L-malic, L-aspartic, lactic and formic acids were used but did not increase the discrimination. Three biogroups (7, 2 and 5) accounted for 79 per cent of the cultures examined.

L11 ANSWER 1 OF 85 MEDLINE
TI National outbreak of *Salmonella* *senftenberg* associated with infant food.

L11 ANSWER 2 OF 85 MEDLINE
TI A plasmid-mediated CMY-2 beta-lactamase from an Algerian clinical isolate of *Salmonella* *senftenberg* .

L11 ANSWER 3 OF 85 MEDLINE
TI CTnscr94, a conjugative transposon found in enterobacteria.

L11 ANSWER 4 OF 85 MEDLINE
TI Naturally occurring deletions in the centisome 63 pathogenicity island of environmental isolates of *Salmonella* spp.

L11 ANSWER 5 OF 85 MEDLINE
TI Isolation of *Salmonella* *senftenberg* bacteriophages.

L11 ANSWER 6 OF 85 MEDLINE
TI Characteristics of *Salmonella* strains isolated from sporadic diarrheal cases during 1992-1994 in the Philippines.

L11 ANSWER 7 OF 85 MEDLINE
TI Nosocomial outbreak of gastroenteritis due to *Salmonella* *senftenberg* .

L11 ANSWER 8 OF 85 MEDLINE
TI In vitro fructooligosaccharide utilization and inhibition of *Salmonella* spp. by selected bacteria.

L11 ANSWER 9 OF 85 MEDLINE
TI Transmission of lethal *Salmonella* *senftenberg* from mother's breast-milk to her baby.

L11 ANSWER 10 OF 85 MEDLINE
TI Ciprofloxacin resistance among multidrug resistant strains of *Salmonella* *senftenberg* in India [letter].

L11 ANSWER 11 OF 85 MEDLINE
TI *Salmonella* *senftenberg* : epidemics in India and present status.

L11 ANSWER 12 OF 85 MEDLINE
TI *Salmonella* group-E (***Senftenberg*) lung abscess: a case report.

L11 ANSWER 13 OF 85 MEDLINE
TI Development of a conjoint phage typing & biotyping schema for *Salmonella* enterica serovar *Senftenberg* (S. *senftenberg*) & the correlation of biotypes with phage types.

L11 ANSWER 14 OF 85 MEDLINE
TI Correlation of phospholipase A & enterotoxin production by *Salmonella* typhimurium with reference to virulence parameters.

L11 ANSWER 15 OF 85 MEDLINE
TI Survival of *Salmonella* *senftenberg* and *Salmonella* typhimurium in glassy and rubbery states of gelatin.

L11 ANSWER 16 OF 85 MEDLINE
TI Survival of Salmonellas in composted and not composted solid animal manure.

L11 ANSWER 17 OF 85 MEDLINE
TI *Salmonella* *senftenberg* septicemia: a nursery outbreak.

L11 ANSWER 18 OF 85 MEDLINE
TI Serotypes of *Salmonella* isolated from California turkey flocks and their environment in 1984-89 and comparison with human isolates.

L11 ANSWER 19 OF 85 MEDLINE
TI The occurrence of salmonellae in bean sprouts in Thailand.

L11 ANSWER 20 OF 85 MEDLINE
TI Transferable drug resistance in *Salmonella* *senftenberg* .

L11 ANSWER 21 OF 85 MEDLINE
TI Incidence of *salmonella* meningitis in Ludhiana (Punjab).

L11 ANSWER 22 OF 85 MEDLINE
TI *Salmonella* -induced enteritis. Clinical, serotypes and treatment.

L11 ANSWER 23 OF 85 MEDLINE
TI Asymptomatic *Salmonella* *senftenberg* carriage in a neonatal ward.

L11 ANSWER 24 OF 85 MEDLINE
TI Use of ribotyping for characterization of *Salmonella* serotypes.

L11 ANSWER 25 OF 85 MEDLINE
TI Novobiocin-brilliant green-glycerol-lactose-agar: further routine evaluation on 5554 human stools and 982 veterinary samples.

L11 ANSWER 26 OF 85 MEDLINE
TI Amplification of an invA gene sequence of *Salmonella* typhimurium by polymerase chain reaction as a specific method of detection of *Salmonella* .

L11 ANSWER 27 OF 85 MEDLINE
TI *Salmonella* enteritidis-specific monoclonal antibodies.

L11 ANSWER 28 OF 85 MEDLINE
TI *Salmonella* *senftenberg* carrier state in a neonate following septicemia [letter].

L11 ANSWER 29 OF 85 MEDLINE
TI [Kinetics of the inactivation of *Salmonella* during thermal disinfection of liquid manure]. Kinetik der Inaktivierung von Salmonellen bei der thermischen Desinfektion von Flussigmist.

L11 ANSWER 30 OF 85 MEDLINE
TI Differentiation of *Salmonella* *senftenberg* into biogroups.

L11 ANSWER 31 OF 85 MEDLINE
TI Isolation of *Salmonella* *senftenberg* from different clinical sources.

L11 ANSWER 32 OF 85 MEDLINE
TI Nosocomial infection due to *salmonella* *senftenberg* (case report).

L11 ANSWER 33 OF 85 MEDLINE
TI Decreased *Salmonella* colonization in turkey poults inoculated with anaerobic cecal microflora and provided dietary lactose.

L11 ANSWER 34 OF 85 MEDLINE
TI [Disinfection studies with *Salmonella* *senftenberg* using egg shells as germ carriers]. Desinfektionsversuche mit *Salmonella* *senftenberg* unter Verwendung von Eischalen als Keimtrager.

L11 ANSWER 35 OF 85 MEDLINE
TI Extent of salmonellae contamination in breeder hatcheries.

L11 ANSWER 36 OF 85 MEDLINE
TI Development and application of an ELISA for detecting antibodies to *Salmonella* enteritidis in chicken flocks.

L11 ANSWER 37 OF 85 MEDLINE
TI Production and characterization of a monoclonal antibody specific for *Salmonella* O19-antigen.

L11 ANSWER 38 OF 85 MEDLINE
TI *Salmonella* *senftenberg* outbreak in a neonatal unit.

L11 ANSWER 39 OF 85 MEDLINE
TI Sandwich enzyme immunoassays for detection of *Salmonella* typhi.

L11 ANSWER 40 OF 85 MEDLINE
TI A comparative study of the heat resistance of salmonellas in homogenized whole egg, egg yolk or albumen.

L11 ANSWER 41 OF 85 MEDLINE
TI Osteomyelitis: a rare complications of *Salmonella* *senftenberg* infection--a case report.

L11 ANSWER 42 OF 85 MEDLINE
TI Evaluation of coagglutination test for serotyping of enteropathogenic bacteria.

L11 ANSWER 43 OF 85 MEDLINE
TI The survival of salmonellas in shell eggs cooked under simulated domestic conditions.

L11 ANSWER 44 OF 85 MEDLINE
TI Effect of a new pelleting process on the level of contamination of poultry mash by Escherichia coli and *Salmonella* .

L11 ANSWER 45 OF 85 MEDLINE

TI [The tenacity of bacteria in the airborne state. VI. Tenacity of airborne S. *senftenberg*]. Die Tenazitat von Bakterien im luftgetragenen Zustand. VI. Mitteilung: Tenazitat luftgetragener S. *senftenberg* .

L11 ANSWER 46 OF 85 MEDLINE
TI *Salmonella* *senftenberg* epidemic in a neonatal nursery.

L11 ANSWER 47 OF 85 MEDLINE
TI [Species structure of Salmonellae isolated from mammals, poultry, feed mixtures and the environment 1976-1980]. Vidova struktura na salmonelite, izolirani ot bozainitsi, ptitsi, furazhni smeski i vunshna sreda za perioda 1976-1980 g.

L11 ANSWER 48 OF 85 MEDLINE
TI [Sensitivity of Salmonellae isolated from poultry to bacteriophage O1]. Chuvstvitelnost na salmoneli, izolirani ot ptitsi, kum bakteriofag O1.

L11 ANSWER 49 OF 85 MEDLINE
TI *Salmonella* shed by horses with colic.

L11 ANSWER 50 OF 85 MEDLINE
TI Molecular relationships between virulence plasmids of *Salmonella* serotypes typhimurium and dublin and large plasmids of other *Salmonella* serotypes.

L11 ANSWER 51 OF 85 MEDLINE
TI [Survival of salmonellas and ascaris eggs during sludge utilization in forestry (author's transl)]. Untersuchungen uber die Tenazitat von Salmonellen und Askarideneiern bei der Ausbringung von Klarschlamm in Waldbestanden.

L11 ANSWER 52 OF 85 MEDLINE
TI Salt extends the upper temperature limit for growth of food-poisoning bacteria.

L11 ANSWER 53 OF 85 MEDLINE
TI Behavior of pathogenic bacteria in the oyster, Crassostrea commercialis, during depuration, re-laying, and storage.

L11 ANSWER 54 OF 85 MEDLINE
TI [***Salmonella* destruction by heating during the customary preparation of dehydrated food products (author's transl)]. *Salmonella* - Abtotung durch Warme bei der Zubereitung von Lebensmittel-Trockenprodukten.

L11 ANSWER 55 OF 85 MEDLINE
TI The occurrence of *salmonella* in waste water from Danish slaughterhouses. A quantitative study.

L11 ANSWER 56 OF 85 MEDLINE
TI Alternation of low and high affinities of secreted and cell-bound antibodies during the anamnestic response of rabbits to *Salmonella* *senftenberg* microorganisms.

L11 ANSWER 57 OF 85 MEDLINE
TI Incidence of infections with *Salmonella* enteritidis serotypes in Black and Indian children. A 16-year survey.

L11 ANSWER 58 OF 85 MEDLINE
TI *Salmonella* serotypes encountered in animal feed additives in Lebanon.

L11 ANSWER 59 OF 85 MEDLINE
TI The effect of compounds which degrade hydrogen peroxide on the enumeration of heat-stressed cells of *Salmonella* *senftenberg* .

L11 ANSWER 60 OF 85 MEDLINE
TI [Isolation of R-phase strains of S. *senftenberg* form fish meal]. Prouchvane na izolirani ot ribeno brashno shtamove S. *senftenberg* v R-faza.

L11 ANSWER 61 OF 85 MEDLINE
TI A survey of *normal* broiler mortality in East Anglia.

L11 ANSWER 62 OF 85 MEDLINE
TI Age-dependent resistance of chicken of *Salmonella* in vitro: antibacterial activity of lysed granule fraction of splenic adherent cells.

L11 ANSWER 63 OF 85 MEDLINE
TI Age-dependent resistance of chickens to *salmonella* in vitro: phagocytic and bactericidal activities of splenic phagocytes.

L11 ANSWER 64 OF 85 MEDLINE
TI Culture method for detection of *Salmonella* in dried active yeast: collaborative study.

L11 ANSWER 65 OF 85 MEDLINE
TI Minimal medium recovery of thermally injured *Salmonella* *senftenberg* 4969.

L11 ANSWER 66 OF 85 MEDLINE
TI [Do immunization of rabbits by N-acetylgalactosamine and a disaccharide linked to a protein produce anti-microbial antibodies (author's transl)]. Essai de production chez le lapin d'anticorps antimicrobiens par immunisation avec la N-acetylgalactosamine et un dioside lies a une proteine.

L11 ANSWER 67 OF 85 MEDLINE
TI Destruction of *Salmonella* on poultry meat with lysozyme, EDTA, x-ray, microwave and chlorine.

L11 ANSWER 68 OF 85 MEDLINE
TI *Salmonella* survival on pecans as influenced by processing and storage conditions.

L11 ANSWER 69 OF 85 MEDLINE
TI Molecular immunological heterogeneity of the *Salmonella* zuerich [1, 9, 12, (46), 27] cell-wall polysaccharides.

L11 ANSWER 70 OF 85 MEDLINE
TI [Changes in the specificity of antibodies appearing in the beginning of immunization by * ***Salmonella* *senftenberg* * (author's transl)]. Evolution de la specificite des anticorps apparaissant en debut d'immunisation par *Salmonella* *senftenberg* .

L11 ANSWER 71 OF 85 MEDLINE
TI Effect of water activity on heat survival of Staphylococcus aureus, *Salmonella* typhimurium and Salm. *senftenberg* .

L11 ANSWER 72 OF 85 MEDLINE
TI Inactivation of strains of *Salmonella* *senftenberg* by gamma irradiation.

L11 ANSWER 73 OF 85 MEDLINE
TI Viability of Staphylococcus aureus, *Salmonella* typhimurium and *Salmonella* *senftenberg* heated and recovered on a solid medium of controlled water activity.

L11 ANSWER 74 OF 85 MEDLINE
TI Epidemiological studies on *Salmonella* *senftenberg* . II. Infections in farm animals.

L11 ANSWER 75 OF 85 MEDLINE
TI Epidemiological studies on *Salmonella* *senftenberg* . I. Relations between animal foodstuff, animal and human isolations.

L11 ANSWER 76 OF 85 MEDLINE
TI *Salmonella* *senftenberg* in the Sunderland area.

L11 ANSWER 77 OF 85 MEDLINE
TI Thermal inactivation of *Salmonella* *senftenberg* 775W in poultry meat.

L11 ANSWER 78 OF 85 MEDLINE
TI The effect of moisture and storage temperature on a *Salmonella* *senftenberg* 775W population in meat and bone meal.

L11 ANSWER 79 OF 85 MEDLINE
TI Effect of pH and chelating agents on the heat resistance and viability of *Salmonella* typhimurium Tm-1 and *Salmonella* *senftenberg* 775W in egg white.

L11 ANSWER 80 OF 85 MEDLINE
TI Thermal resistance of *Salmonella* *senftenberg* 775W in dry animal feeds.

L11 ANSWER 81 OF 85 MEDLINE
TI Heat resistance of *Salmonella* : the uniqueness of *Salmonella* *senftenberg* 775W.

L11 ANSWER 82 OF 85 MEDLINE
TI Heat resistance of *Salmonella* typhimurium and *Salmonella* *senftenberg* 775W in milk chocolate.

L11 ANSWER 83 OF 85 MEDLINE
TI Thermal resistance of smooth and rough derivatives of *Salmonella* *senftenberg* 775 W.

L11 ANSWER 84 OF 85 MEDLINE
TI Initial evaluation of the effect of butylated hydroxytoulene upon *Salmonella* *senftenberg* 775W.

L11 ANSWER 85 OF 85 MEDLINE
TI Heat resistance of *Salmonella* typhimurium and *Salmonella* *senftenberg* 775 W in chicken meat.

L11 ANSWER 22 OF 85 MEDLINE AN 93210422 MEDLINE DN 93210422
TI *Salmonella* -induced enteritis. Clinical, serotypes and treatment.
AU Ramadan F; Unni A G; Hablas R; Rizk M S
CS Medical Department, Royal Commission Hospital, Yanbu, Kingdom of Saudi Arabia..

SO JOURNAL OF THE EGYPTIAN PUBLIC HEALTH ASSOCIATION, (1992) 67 (3-4) 357-67. Journal code: I07. ISSN: 0013-2446. CY Egypt
DT Journal; Article; (JOURNAL ARTICLE) LA English EM 199307
AB "Salmonella" -induced enteritis is a widespread cause of morbidity and mortality especially in developing countries. The frequency of different "Salmonella" serotypes in different areas varies according to time and locality. The prevalence of different "Salmonella" serotypes in Yanbu area was studied in 136 stool cultures from patients admitted with gastroenteritis, to the medical ward of Royal Commission Hospital in the period 1/6/1991 to 30/10/1991. Fifteen different "Salmonella" serotypes were determined among 31 positive "Salmonella" isolates and all were of the gastroenteric group, diarrhoeagenic but noninvasive. The most common serotype was S. typhimurium (45.16%) followed by S. enteritidis (9.62%) then S. virchow (6.46%). Other forms of "Salmonella" were isolated from one patient each 3.23%, S. paratyphi B java, S. heidelberg, S. livingstone, S. infantis, S. bovis morbificans, S. corvallis, S. eastbourne, S. give, S. "senftenberg" , S. poona, S. adelaide, and S. johannesburg. Saudi patients comprised about 71% and 29% were patients of four different nationalities. Antibiograms of these cultures proved to be all sensitive to norfloxacin with different forms of resistance to chloramphenicol, ampicillin and trimethoprim. Norfloxacin proved to be effective in the treatment of resistant forms of "Salmonella" with negligible side effects and wide safety range.

L13 ANSWER 1 OF 1 MEDLINE
TI Development of a conjoint phage typing & biotyping schema for "Salmonella" "enterica" serovar "Senftenberg" (S. "senftenberg") & the correlation of biotypes with phage types.

FILE 'REGISTRY' ENTERED AT 12:11:54 ON 09 DEC 1997
L1 477 S HYDRATASE?

FILE 'MEDLINE' ENTERED AT 12:12:06 ON 09 DEC 1997
L2 1 S L1

FILE 'REGISTRY' ENTERED AT 12:12:32 ON 09 DEC 1997
L3 581 S DEHYDRATASE?

FILE 'MEDLINE' ENTERED AT 12:12:50 ON 09 DEC 1997
L4 5 S L3

FILE 'REGISTRY' ENTERED AT 12:13:58 ON 09 DEC 1997
L5 1 S GLYCEROL DEHYDRATASE
L6 2 S DIOL DEHYDRATASE

FILE 'MEDLINE' ENTERED AT 12:14:36 ON 09 DEC 1997
L7 0 S L5
L8 0 S L6
E DEHYDRATASES/CT
E E4
E DEHYDRATASE/CT
E DEHYDRATASE/CN
E HYDRO LYASES
E HYDRO LYASES/CT
L9 2938 S E9
L10 77716 S CLONING, MOLECULAR/CT
L11 125 S L9 AND L10
L12 37111 S KLEBSIELLA OR LACTOBACILLUS OR ENTEROBACTER OR CITROBACTER OR PELOBACTER OR ILYOBACTER OR CLOSTRIDIUM
L13 4 S L11 AND L12
E GLYCEROL DEHYDRATASE
E GLYCEROL DEHYDRATASE/CT
E DIOL DEHYDRATASE
E DIOL DEHYDRATASE/CT
E DIOL DEHYDRATASE/CN
E GLYCEROL DEHYDRATASE/CN
L14 12 S E3
L15 0 S L14 NOT L9
L16 155 S L12 AND L9 NOT L13
E KLEBSIELLA/CN
E KLEBSIELLA/CT
E L9
E HYDRO LYASES/CT
L17 291 S E22
L18 7 S L17 AND L12
L19 3 S L18 NOT L13

FILE 'SCISEARCH' ENTERED AT 12:32:16 ON 09 DEC 1997
E SPRENGER G, 1989/RE
E SPRENGER G A, 1989/RE
L20 9 S E4

L4 ANSWER 1 OF 5 MEDLINE
TI Site-directed mutagenesis of monofunctional chorismate mutase engineered from the E. coli P-protein.

L4 ANSWER 2 OF 5 MEDLINE
TI Genetic aspects of aromatic amino acid biosynthesis in Lactococcus lactis.

L4 ANSWER 3 OF 5 MEDLINE
TI The pheA/tyrA/aroF region from Erwinia herbicola: an emerging comparative basis for analysis of gene organization and regulation in enteric bacteria.

L4 ANSWER 4 OF 5 MEDLINE
TI Loss of allosteric control but retention of the bifunctional catalytic competence of a fusion protein formed by excision of 260 base pairs from the 3' terminus of pheA from Erwinia herbicola.

L4 ANSWER 5 OF 5 MEDLINE
TI Cloning, sequencing, and expression of the P-protein gene (pheA) of Pseudomonas stutzeri in Escherichia coli: implications forevolutionary relationships in phenylalanine biosynthesis.

L13 ANSWER 1 OF 4 MEDLINE AN 96422012 MEDLINE
TI Cloning, sequencing, and overexpression of the genes encoding coenzyme B12-dependent glycerol dehydratase of **Citrobacter*** freundii.
AU Seyfried M; Daniel R; Gottschalk G
CS Institut fur Mikrobiologie der Georg-August-Universitat, Gottingen, Germany.
SO JOURNAL OF BACTERIOLOGY, (1996 Oct) 178 (19) 5793-6. Journal code: HH3. ISSN: 0021-9193. CY United States
DT Journal; Article; (JOURNAL ARTICLE) LA English FS Priority Journals OS GENBANK-U09771 EM 9701 EW 19970104
AB The genes encoding coenzyme B12-dependent glycerol dehydratase of *Citrobacter* freundii were cloned and overexpressed in Escherichia coli. The B12-free enzyme was purified to homogeneity. It consists of three types of subunits whose N-terminal sequences are in accordance with those deduced from the open reading frames dhaB, dhaC, and dhaE, coding for subunits of 60,433 (alpha), 21,487 (beta), and 16,121 (gamma) Da, respectively. The enzyme complex has the composition alpha2beta2gamma2. Amino acid alignments with the subunits of the recently sequenced diol dehydratase of *Klebsiella* oxytoca (T. Tobimatsu, T. Hara, M. Sakaguchi, Y. Kishimoto, Y. Wada, M. Isoda, T. Sakai, and T. Toraya, J. Biol. Chem. 270:7142-7148, 1995) revealed identities between 51.8 and 70.9%.
CT Check Tags: Comparative Study Bacterial Proteins: BI, biosynthesis *Bacterial Proteins: GE, genetics Bacterial Proteins: IP, isolation & purification Chromatography, Affinity *** Citrobacter freundii: EN, enzymology*** ****Citrobacter freundii: GE, genetics*** *** Cloning, Molecular*** *Cobamides: ME, metabolism Escherichia coli: GE, genetics *Genes, Bacterial *** Hydro-Lyases: BI, biosynthesis*** ****Hydro-Lyases: GE, genetics*** *** Hydro-Lyases: IP, isolation & purification*** Molecular Sequence Data Protein Conformation Recombinant Proteins: BI, biosynthesis Recombinant Proteins: IP, isolation & purification Sequence Analysis, DNA Sequence Homology, Amino Acid Species Specificity
CN EC 4.2.1. (Hydro-Lyases); EC 4.2.1.30 (glycerol dehydratase); 0 (Bacterial Proteins); 0 (Cobamides); 0 (Recombinant Proteins)

L13 ANSWER 2 OF 4 MEDLINE AN 96394290 MEDLINE
TI Cloning, sequencing, and high level expression of the genes encoding adenosylcobalamin-dependent glycerol dehydrase of ***Klebsiella*** pneumoniae.
AU Tobimatsu T; Azuma M; Matsubara H; Takatori H; Niida T; Nishimoto K; Satoh H; Hayashi R; Toraya T
CS Department of Bioscience and Biotechnology, Faculty of Engineering, Okayama University, Tsushima-Naka, Okayama 700, Japan.
SO JOURNAL OF BIOLOGICAL CHEMISTRY, (1996 Sep 13) 271 (37) 22352-7. Journal code: HIV. ISSN: 0021-9258.CY United StatesDT Journal; Article; (JOURNAL ARTICLE) LA English FS Priority Journals; Cancer Journals EM 9701 EW 19970104
AB The gld genes encoding adenosylcobalamin-dependent glycerol dehydrase of *Klebsiella* pneumoniae were cloned by cross-hybridization with a DNA fragment of *Klebsiella* oxytoca diol dehydrase genes. Since the Escherichia coli clones isolated did not show appreciable enzyme activity, plasmids for high level expression of cloned genes were constructed. The enzyme expressed in E. coli was indistinguishable from the wild-type glycerol dehydrase of K. pneumoniae by the criteria of polyacrylamide gel electrophoretic, immunochemical, and catalytic properties. It was also shown that the recombinant functional enzyme consists of Mr 61,000, 22,000, and 16, 000 subunits. Sequence analysis of the genes revealed four open reading frames separated by 2-12 bases. The sequential three open reading frames from the first to the third (gldA, gldB, and gldC genes) encoded polypeptides of 555, 194, and 141 amino acid residues with predicted molecular weights of 60,659(alpha), 21,355(beta), and 16,104(gamma), respectively. High level expression of these three genes in E. coli produced more than 14-fold higher level of fully active apoenzyme than that in K. pneumoniae. It was thus concluded that these are the genes encoding the subunits of glycerol dehydrase. The deduced amino acid sequences of the three subunits were 71, 58, and 54% identical with those of the alpha, beta, and gamma subunits of diol dehydrase, respectively, but failed to show any apparent homology with other proteins.
CT Check Tags: Support, Non-U.S. Gov't Amino Acid Sequence Base Sequence *** Cloning, Molecular*** DNA, Bacterial: CH, chemistry Electrophoresis, Gel, Two-Dimensional Escherichia coli Gene Expression Regulation, Enzymologic *** Hydro-Lyases: CH, chemistry*** ****Hydro-Lyases: GE, genetics*** *** Hydro-Lyases: ME, metabolism*** ****Klebsiella pneumoniae: EN, enzymology*** Molecular Sequence Data Plasmids: ME, metabolism Propanediol Dehydratase: CH, chemistry Propanediol Dehydratase: GE, genetics Propanediol Dehydratase: ME, metabolism Restriction Mapping Sequence Homology, Amino Acid Sequence Homology, Nucleic Acid
CN EC 4.2.1. (Hydro-Lyases); EC 4.2.1.28 (Propanediol Dehydratase); EC 4.2.1.30 (glycerol dehydratase); 0 (DNA, Bacterial); 0 (Plasmids)

L13 ANSWER 3 OF 4 MEDLINE AN 93122543 MEDLINE
TI Growth temperature-dependent activity of glycerol dehydratase in Escherichia coli expressing the ***Citrobacter*** freundii dha regulon.
AU Daniel R; Gottschalk G
CS Institute fur Mikrobiologie, Georg-August-Universitat, Gottingen, FRG..

SO FEMS MICROBIOLOGY LETTERS, (1992 Dec 15) 79 (1-3) 281-5. Journal code: FML. ISSN: 0378-1097. CY Netherlands DT Journal; Article; (JOURNAL ARTICLE)
LA English FS Priority Journals EM 9304
AB Using the cosmid pWE15, a genomic library of ***Citrobacter*** freundii DNA in Escherichia coli ECL707 was prepared and screened for glycerol utilization. Six out of approximately 3000 clones were positive. One clone, harboring the recombinant cosmid pRD1, expressed glycerol dehydratase in high activity when grown at 28 degrees C but not at 37 degrees C. The growth temperature had little effect on the activity of the other enzymes encoded by the dha regulon. When the glycerol-containing medium was supplemented with corrinoids, the recombinant E. coli strain produced 1,3-propanediol in high amounts at 28 degrees C.
CT Check Tags: Support, Non-U.S. Gov't ****Citrobacter freundii: EN, enzymology*** *** Citrobacter freundii: GE, genetics*** *** Cloning, Molecular*** *Escherichia coli: EN, enzymology Escherichia coli: GD, growth & development Escherichia coli: GE, genetics Genes, Bacterial Genes, Regulator Glycerin: ME, metabolism *** Hydro-Lyases: GE, genetics*** ****Hydro-Lyases: ME, metabolism*** Propanediols: ME, metabolism Temperature
RN 504-63-2 (1,3-propanediol); 56-81-5 (Glycerin)
CN EC 4.2.1. (Hydro-Lyases); EC 4.2.1.30 (glycerol dehydratase); 0 (Propanediols)
GEN dha

L13 ANSWER 4 OF 4 MEDLINE AN 92412068 MEDLINE
TI Cloning and properties of a cyanide hydratase gene from the phytopathogenic fungus Gloeocercospora sorghi.
AU Wang P; VanEtten H D
CS Department of Plant Pathology, University of Arizona, Tucson 85721..
SO BIOCHEMICAL AND BIOPHYSICAL RESEARCH COMMUNICATIONS, (1992 Sep 16) 187 (2) 1048-54. Journal code: 9Y8. ISSN: 0006-291X. CY United States DT Journal; Article; (JOURNAL ARTICLE) LA English FS Priority Journals; Cancer Journals
OS GENBANK-M99044; GENBANK-S41678; GENBANK-S41679; GENBANK-S41680; GENBANK-S41731; GENBANK-D10916; GENBANK-D10917; GENBANK-D10918; GENBANK-D10919; GENBANK-D10920 EM 9212
AB The Cht gene encoding cyanide hydratase (CHT, EC 4.2.1.66), which detoxifies HCN and is thought to be important in fungal infection of cyanogenic plants, has been cloned from the phytopathogenic fungus Gloeocercospora sorghi. The gene was isolated by screening an expression library of G. sorghi using a CHT-specific antibody and using one of the positive cDNA clones as a probe in Southern hybridization to identify a 3.1 kb PstI genomic fragment. This PstI fragment expressed CHT activity when transformed into Aspergillus nidulans, a fungus that normally lacks CHT activity. Sequence analysis identified a single open reading frame of 1,107 base pairs which encodes a polypeptide of 40,904 daltons. The deduced amino acid sequence of CHT shares 36.5% identity to a nitrilase from the bacterium ***Klebsiella*** pneumoniae subsp. ozaenae.
CT Check Tags: Comparative Study Amino Acid Sequence Aminohydrolases: CH, chemistry Aspergillus nidulans: GE, genetics Base Sequence Blotting, Southern ****Cloning, Molecular*** DNA: CH, chemistry DNA: IP, isolation & purification DNA Probes *** Hydro-Lyases: CH, chemistry*** ****Hydro-Lyases: GE, genetics*** *Hyphomycetes: EN, enzymology Hyphomycetes: GE, genetics *** Klebsiella pneumoniae: EN, enzymology*** Molecular Sequence Data Nucleic Acid Hybridization Poly A: GE, genetics Potassium Cyanide: PD, pharmacology RNA: GE, genetics Sequence Homology, Nucleic Acid Transcription, Genetic Transformation, Genetic Translation, Genetic
RN 151-50-8 (Potassium Cyanide); 24937-83-5 (Poly A); 63231-63-0 (RNA); 9007-49-2 (DNA)
CN EC 3.5.4. (Aminohydrolases); EC 3.5.5.1 (nitrilase); EC 4.2.1. (Hydro-Lyases); EC 4.2.1.66 (cyanide hydratase); 0 (DNA Probes); 0 (RNA, Messenger)

L19 ANSWER 1 OF 3 MEDLINE
TI Analysis of acyl coenzyme A binding to the transcription factor FadR and identification of amino acid residues in the carboxyl terminus required for ligand binding.

L19 ANSWER 2 OF 3 MEDLINE
TI The nucleotide sequence of genes involved in the leucine biosynthetic pathway of ***Clostridium*** pasteurianum.

L19 ANSWER 3 OF 3 MEDLINE AN 90155202 MEDLINE
TI Anaerobic growth of Escherichia coli on glycerol by importing genes of the dha regulon from ***Klebsiella*** pneumoniae.
AU Sprenger G A; Hammer B A; Johnson E A; Lin E C
CS Department of Microbiology and Molecular Genetics, Harvard Medical School, Boston, MA 02115.
NC 5-RO1-GM11983 (NIGMS)
SO JOURNAL OF GENERAL MICROBIOLOGY, (1989 May) 135 (Pt 5) 1255-62. Journal code: I87. ISSN: 0022-1287. CY ENGLAND: United Kingdom
DT Journal; Article; (JOURNAL ARTICLE) LA English FS Priority Journals EM 9005
AB The dha regulon of ***Klebsiella*** pneumoniae specifying fermentative dissimilation of glycerol was mobilized by the broad-host-range plasmid RP4:mini Mu and introduced conjugatively into Escherichia coli. The recipient E. coli was enabled to grow anaerobically on glycerol without added hydrogen acceptors, although its cell yield was less than that of K. pneumoniae. The reduced cell yield was probably due to the lack of the coenzyme-B12-dependent glycerol dehydratase of the dha system. This enzyme initiates the first step in an auxiliary pathway for disposal of the extra reducing equivalents from glycerol. The lack of this enzyme would also account for the absence of 1,3-propanediol (a hallmark fermentation product of glycerol) in the spent culture medium. In a control experiment, a large quantity of this compound was detected in a similar culture medium following the growth of K. pneumoniae. The other three known enzymes of the dha system, glycerol dehydrogenase, dihydroxyacetone kinase and 1,3-propanediol oxidoreductase, however, were synthesized at levels comparable to those found in K. pneumoniae. Regulation of the dha system in E. coli appeared to follow the same pattern as in K. pneumoniae: the three acquired enzymes were induced by glycerol, catabolite repressed by glucose, and glycerol dehydrogenase was post-translationally inactivated during the shift from anaerobic to aerobic growth. The means by which the E. coli recipient can achieve redox balance without formation of 1,3-propanediol during anaerobic growth on glycerol remains to be discovered.
CT Check Tags: Support, Non-U.S. Gov't; Support, U.S. Gov't, P.H.S. Alcohol Oxidoreductases: GE, genetics Anaerobiosis Bacterial Proteins: GE, genetics Conjugation, Genetic Energy Metabolism *Escherichia coli: GD, growth & development Escherichia coli: GE, genetics Escherichia coli: ME, metabolism Fermentation *Genes, Bacterial Glycerin: ME, metabolism *** Hydro-Lyases: GE, genetics*** Hydro-Lyases: PH, physiology ****Klebsiella pneumoniae: GE, genetics*** Oxidation-Reduction Phosphotransferases: GE, genetics Plasmids Sugar Alcohol Dehydrogenases: GE, genetics
RN 56-81-5 (Glycerin)
CN EC 1.1 (Alcohol Oxidoreductases); EC 1.1. (Sugar Alcohol Dehydrogenases); EC 1.1.1.6 (glycerol dehydrogenase); EC 1.1.1.77 (lactaldehyde reductase); EC 2.7 (Phosphotransferases); EC 2.7.1.29 (glycerone kinase); EC 4.2.1. (Hydro-Lyases); EC 4.2.1.30 (glycerol dehydratase); 0 (Bacterial Proteins); 0 (Plasmids)

L20 ANSWER 1 OF 9 SCISEARCH COPYRIGHT 1997 ISI (R)
TI Glycerol conversion to 1,3-propanediol by Clostridium pasteurianum: cloning and expression of the gene encoding 1,3-propanediol dehydrogenase

L20 ANSWER 2 OF 9 SCISEARCH COPYRIGHT 1997 ISI (R)
TI Structure and gene-polypeptide relationships of the region encoding glycerol diffusion facilitator (glpF) and glycerol kinase (glpK) of Pseudomonas aeruginosa

L20 ANSWER 3 OF 9 SCISEARCH COPYRIGHT 1997 ISI (R)
TI BIOCHEMICAL AND MOLECULAR CHARACTERIZATION OF THE OXIDATIVE BRANCH OF GLYCEROL UTILIZATION BY CITROBACTER-FREUNDII

L20 ANSWER 4 OF 9 SCISEARCH COPYRIGHT 1997 ISI (R)
TI CLONING AND NUCLEOTIDE-SEQUENCE OF THE GLPD GENE ENCODING SN-GLYCEROL-3-PHOSPHATE DEHYDROGENASE OF PSEUDOMONAS-AERUGINOSA

L20 ANSWER 5 OF 9 SCISEARCH COPYRIGHT 1997 ISI (R)
TI DIOL DEHYDRASE AND GLYCEROL DEHYDRASE, COENZYME B-12-DEPENDENT ISOZYMES

L20 ANSWER 6 OF 9 SCISEARCH COPYRIGHT 1997 ISI (R)
TI MAPPING AND CLONING OF GLDA, THE STRUCTURAL GENE OF THE ESCHERICHIA-COLI GLYCEROL DEHYDROGENASE

L20 ANSWER 7 OF 9 SCISEARCH COPYRIGHT 1997 ISI (R)
TI ANALYSIS OF THE ESCHERICHIA-COLI GENOME .4. DNA-SEQUENCE OF THE REGION FROM 89.2 TO 92.8 MINUTES

L20 ANSWER 8 OF 9 SCISEARCH COPYRIGHT 1997 ISI (R)
TI GROWTH TEMPERATURE-DEPENDENT ACTIVITY OF GLYCEROL DEHYDRATASE IN ESCHERICHIA-COLI EXPRESSING THE CITROBACTER-FREUNDII DHA REGULON

L20 ANSWER 9 OF 9 SCISEARCH COPYRIGHT 1997 ISI (R)
TI 1,3-PROPANEDIOL PRODUCTION BY ESCHERICHIA-COLI EXPRESSING GENES FROM THE KLEBSIELLA-PNEUMONIAE-DHA REGULON

L20 ANSWER 1 OF 9 SCISEARCH COPYRIGHT 1997 ISI (R) AN 97:718159 SCISEARCH
GA The Genuine Article (R) Number: XX393
TI Glycerol conversion to 1,3-propanediol by Clostridium pasteurianum: cloning and expression of the gene encoding 1,3-propanediol dehydrogenase
AU Luers F; Seyfried M; Daniel R; Gottschalk G (Reprint)
CS UNIV GOTTINGEN, INST MIKROBIOL, GRISEBACHSTR 8, D-37077 GOTTINGEN, GERMANY (Reprint); UNIV GOTTINGEN, INST MIKROBIOL, D-37077 GOTTINGEN, GERMANY CYA GERMANY
SO FEMS MICROBIOLOGY LETTERS, (15 SEP 1997) Vol. 154, No. 2, pp. 337-345. Publisher: ELSEVIER SCIENCE BV, PO BOX 211, 1000 AE AMSTERDAM, NETHERLANDS.
ISSN: 0378-1097. DT Article; Journal FS LIFE LA English REC Reference Count: 34
AB When grown on glycerol as sole carbon and energy source, cell extracts of Clostridium pasteurianum exhibited activities of glycerol dehydrogenase, dihydroxyacetone kinase, glycerol dehydratase and 1,3-propanediol dehydrogenase. The genes encoding the latter two enzymes were cloned by colony hybridization using the dhaT gene of Citrobacter freundii as heterologous DNA probe and expressed in Escherichia coli. The native molecular mass of 1,3-propanediol dehydrogenase (DhaT) is 440 000 Da. The dhaT gene of C. pasteurianum was subcloned and its nucleotide sequence (1158 bp) was determined. The deduced gene product (41 776 Dal revealed high similarity to DhaT of C. freundii (80.5% identity; 89.8% similarity).
CC MICROBIOLOGY
ST Author Keywords: Clostridium pasteurianum; 1,3-propanediol dehydrogenase; 1,3-propanediol; glycerol fermentation; type III alcohol dehydrogenase; glycerol dehydratase

STP KeyWords Plus (R): ESCHERICHIA-COLI; ALCOHOL-DEHYDROGENASE; CITROBACTER-FREUNDII; MOLECULAR CHARACTERIZATION; KLEBSIELLA-PNEUMONIAE; ZYMOMONAS-MOBILIS; SEQUENCE-ANALYSIS; DHA REGULON; PROTEINS; OVEREXPRESSION RF 95-0536 001; 11-BETA-HYDROXYSTEROID DEHYDROGENASE; FETAL ORIGINS OF CORONARY HEART-DISEASE; APPARENT MINERALOCORTICOID EXCESS SYNDROMES 95-3190 001; INCREASED ABUNDANCE OF SPECIFIC SKELETAL-MUSCLE PROTEIN-TYROSINE PHOSPHATASES; ALPHA-B-CRYSTALLIN EXPRESSION 95-3375 001; THERMUS STRAINS; DNA RELATEDNESS; GENUS AEROMONAS; EMENDED DESCRIPTION OF CAMPYLOBACTER-HYOINTESTINALIS; POLYPHASIC TAXONOMY 95-5061 001; STRUCTURAL GENE; GLTC-DEPENDENT REGULATION OF BACILLUS-SUBTILIS GLUTAMATE SYNTHASE EXPRESSION; ARABIDOPSIS TYPE-1 PROTEIN PHOSPHATASE

RE Referenced Author (RAU) |Year | VOL | PG (RPY)|(RVL)|(RPG) | Referenced Work (RWK)

ABBADANDALOUSSI S	1996	142	1149	MICROBIOL-UK
ANDERSSON L O	1972	20	199	FEBS LETT
AUSUBEL F M	1987			CURRENT PROTOCOLS MO
BAIROCH A	1991	19	2241	NUCLEIC ACIDS RES
BOENIGK R	1991			THESIS G AUGUST U GO
BRADFORD M M	1976	72	248	ANAL BIOCHEM
CONWAY T	1987	169	2591	J BACTERIOL
CONWAY T	1989	171	3754	J BACTERIOL
DABROCK B	1992	58	1233	APPL ENVIRON MICROB
DANIEL R	1992	100	281	FEMS MICROBIOL LETT
DANIEL R	1995	177	2151	J BACTERIOL
DANIEL R	1995	177	4392	J BACTERIOL
DEVRIES G E	1992	174	5346	J BACTERIOL
FISCHER R J	1993	175	6659	J BACTERIOL
GOODLOVE P E	1989	85	209	GENE
HEYNDRICKX M	1991	34	637	APPL MICROBIOL BIOT
HOMANN T	1990	33	121	APPL MICROBIOL BIOT
JOHNSON E A	1984	160	55	J BACTERIOL
KELL D B	1981	99	81	BIOCHEM BIOPH RES CO
KESSLER D	1992	267	18073	J BIOL CHEM
MARMUR J	1961	3	208	J MOL BIOL
REID M F	1994	20	13	CRIT REV MICROBIOL
RUCH F E	1974	119	50	J BACTERIOL
SANGER F	1977	74	5463	P NATL ACAD SCI USA
SEYFRIED M	1996	178	5793	J BACTERIOL
SOHLING B	1996	178	871	J BACTERIOL
SPRENGER G A	1989	135	1255	J GEN MICROBIOL <--
STOJILJKOVIC I	1995	177	1357	J BACTERIOL
TORAYA T	1977	252	963	J BIOL CHEM
TSE P	1988	110	1295	J AM CHEM SOC
WALTER K A	1992	174	7149	J BACTERIOL
WIERENGA R K	1985	24	1346	BIOCHEMISTRY-US
WILIAMSON V M	1987	209	374	MOL GEN GENET
YOUNGLESON J S	1988	78	355	GENE

L20 ANSWER 3 OF 9 SCISEARCH COPYRIGHT 1997 ISI (R) AN 95:524431 SCISEARCH

GA The Genuine Article (R) Number: RL828

TI BIOCHEMICAL AND MOLECULAR CHARACTERIZATION OF THE OXIDATIVE BRANCH OF GLYCEROL UTILIZATION BY CITROBACTER-FREUNDII

AU DANIEL R; STUERTZ K; GOTTSCHALK G (Reprint)

CS UNIV GOTTINGEN, INST MIKROBIOL, GRISEBACHSTR 8, D-37077 GOTTINGEN, GERMANY (Reprint); UNIV GOTTINGEN, INST MIKROBIOL, D-37077 GOTTINGEN, GERMANY CYA GERMANY

SO JOURNAL OF BACTERIOLOGY, (AUG 1995) Vol. 177, No. 15, pp. 4392-4401. ISSN: 0021-9193. DT Article; Journal

FS LIFE A ENGLISH REC Reference Count: 58

AB Glycerol dehydrogenase (EC 1.1.1.6) and dihydroxyacetone kinase (EC 2.7.1.29) were purified from Citrobacter freundii. The dehydrogenase is a hexamer of a polypeptide of 43,000 Da. The enzyme exhibited a rather broad substrate specificity, but glycerol was the preferred substrate in the physiological direction. The apparent K(m)s of the enzyme for glycerol and NAD(+) were 1.27 mM and 57 mu M, respectively. The kinase is a dimer of a polypeptide of 57,000 Da. The enzyme was highly specific for the substrates dihydroxyacetone and ATP; the apparent K(m)s were 30 and 70 mu M, respectively. The DNA region which contained the genes encoding glycerol dehydrogenase (dhaD) and dihydroxyacetone kinase (dhaK) was cloned and sequenced. Both genes were identified by N-terminal sequence comparison. The deduced dhaD gene product (365 amino acids) exhibited high degrees of homology to glycerol dehydrogenases from other organisms and less homology to type III alcohol dehydrogenases, whereas the dhaK gene product (552 amino acids) revealed no significant homology to any other protein in the databases. A large gene (dhaR) of 1,929 bp was found downstream from dhaD. The deduced gene product (641 amino acids) showed significant similarities to members of the sigma(54) bacterial enhancer-binding protein family.

CC MICROBIOLOGY

STP KeyWords Plus (R): ACTIVATED ALCOHOL-DEHYDROGENASE; METAL DISSOCIATION-CONSTANTS; ESCHERICHIA-COLI; KLEBSIELLA-PNEUMONIAE; ZYMOMONAS-MOBILIS; SACCHAROMYCES-CEREVISIAE; NUCLEOTIDE-SEQUENCE; DHA REGULON; BACILLUS-STEAROTHERMOPHILUS; REGULATORY GENE

RF 93-4847 004; HETEROLOGOUS EXPRESSION; CHROMOSOMAL DNA; GENE ENCODING METHYLMALONYL-COENZYME-A MUTASE 93-7500 002; PROTEIN PHOSPHATASE-1; PHOTOTROPHIC BACTERIUM RHODOBACTER-CAPSULATUS E1F1; CALF UTERUS 93-3088 001; RAT MUSCLE; PROTEIN PHOSPHATASE-1; MAJOR GLUTATHIONE TRANSFERASE 93-6277 001; ESCHERICHIA-COLI MESSENGER-RNA PROMOTER SEQUENCES;TRANSCRIPTION INITIATION; EXPRESSION OF THE CELLULOMONAS-FLAVIGENA CELL-ASSOCIATED AMYLASE GENE 93-7923 001; SULFATE-REDUCING BACTERIUM; ANAEROBIC DEGRADATION; METHANE FORMATION

RE Referenced Author (RAU) |Year | VOL | PG (RPY)|(RVL)|(RPG) | Referenced Work (RWK)

ARNOLD W	1988	203	715	J MOL BIOL
BAIROCH A	1991	19	2241	NUCLEIC ACIDS RES
BLATTNER F R	1993	21	5408	NUCLEIC ACIDS RES
BLUM H	1987	8	93	ELECTROPHORESIS
BOENIGK R	1993	38	453	APPL MICROBIOL BIOT
BRADFORD M M	1976	72	248	ANAL BIOCHEM
CONWAY T	1987	169	2591	J BACTERIOL
CONWAY T	1989	171	3754	J BACTERIOL
DANIEL R	1992	100	281	FEMS MICROBIOL LETT
DANIEL R	1995	177	2151	J BACTERIOL
DEVEREUX J	1984	12	387	NUCLEIC ACIDS RES
DEVRIES G E	1992	174	5346	J BACTERIOL
DREWKE C	1988	950	54	BIOCHIM BIOPHYS ACTA
FISCHER R J	1993	175	6659	J BACTERIOL
FORAGE R G	1982	151	591	J BACTERIOL
FRY D C	1986	83	907	P NATL ACAD SCI USA
GOODLOVE P E	1989	85	209	GENE
HAWLEY D K	1983	11	2237	NUCLEIC ACIDS RES
HOMANN T	1990	33	121	APPL MICROBIOL BIOT
INOUYE S	1988	66	301	GENE
JOHNSON E A	1984	160	55	J BACTERIOL
KESSLER D	1992	267	18073	J BIOL CHEM
KRUGER N	1992	174	4391	J BACTERIOL
KYHSEANDERSEN J	1984	10	203	J BIOCHEM BIOPH METH
LAEMMLI U K	1970	270	680	NATURE
MALLINDER P R	1992	110	9	GENE
MARCK C	1988	16	1829	NUCLEIC ACIDS RES
MARTIN R G	1961	236	1372	J BIOL CHEM
MORETT E	1993	175	6067	J BACTERIOL
PETTIGREW D W	1988	263	135	J BIOL CHEM
PFENNIG N	1966	55	245	ARCH MIKROBIOL
RAMAKRISHNAN G	1990	87	2369	P NATL ACAD SCI USA
REID M F	1994	20	13	CRIT REV MICROBIOL
RUCH F E	1974	119	50	J BACTERIOL
RUCH F E	1980	141	1077	J BACTERIOL
SAMBROOK J	1989			MOL CLONING LABORATO
SANGER F	1977	74	5463	P NATL ACAD SCI USA
SHINE J	1974	71	1342	P NATL ACAD SCI USA
SHINGLER V	1993	175	1596	J BACTERIOL
SIEGEL L M	1966	112	346	BIOCHIM BIOPHYS ACTA
SOHLING B				UNPUB
SPENCER P	1989	994	270	BIOCHIM BIOPHYS ACTA
SPRENGER G A	1989	135	1255	J GEN MICROBIOL <--
SRIDHARA S	1969	98	87	J BACTERIOL
SUTCLIFFE J G	1979	43	77	COLD SPRING HARB SYM
TANG C T	1979	140	182	J BACTERIOL
THORNER J W	1971	246	3885	J BIOL CHEM
TONG I T	1991	57	3541	APPL ENVIRON MICROB
TORAYA T	1977	252	963	J BIOL CHEM
TSE P	1988	110	1295	J AM CHEM SOC
TSE P	1989	111	8703	J AM CHEM SOC
VIEIRA J	1982	19	259	GENE
WALTER K A	1992	174	7149	J BACTERIOL
WANG A Y	1992	31	11020	BIOCHEMISTRY-US
WILLIAMSON V M	1987	209	374	MOL GEN GENET
YAMADA H	1982	46	2333	AGR BIOL CHEM TOKYO
YANISCHPERRON C	1985	33	103	GENE
YOUNGLESON J S	1988	78	355	GENE

L20 ANSWER 5 OF 9 SCISEARCH COPYRIGHT 1997 ISI (R) AN 94:207853 SCISEARCH

GA The Genuine Article (R) Number: BZ91T
TI DIOL DEHYDRASE AND GLYCEROL DEHYDRASE, COENZYME B-12-DEPENDENT ISOZYMES
AU TORAYA T (Reprint)
CS OKAYAMA UNIV, FAC ENGN, DEPT BIOTECHNOL, 3-1-1 TSUSHIMA NAKA, OKAYAMA 700, JAPAN (Reprint)
CYA JAPAN
SO METAL IONS IN BIOLOGICAL SYSTEMS, (1994) Vol. 30, pp. 217-254. ISSN: 0161-5149. DT General Review; Journal
LA ENGLISH REC Reference Count: 110
CC CHEMISTRY, INORGANIC & NUCLEAR; BIOLOGY, MISCELLANEOUS; BIOCHEMISTRY & MOLECULAR BIOLOGY; BIOPHYSICS
STP KeyWords Plus (R): BOND-DISSOCIATION ENERGY; CARBON-COBALT BOND; CO-C BOND; KLEBSIELLA-PNEUMONIAE; CHEMICAL MODIFICATION; ESCHERICHIA-COLI; DHA REGULON; D-RIBOSE; ADENOSYLCOBALAMIN; ENZYME
RE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)
ABELES R H	1976	9	114	ACCOUNTS CHEM RES
ABELES R H	1964	112	695	ANN NY ACAD SCI
ABELES R H	1960	41	531	BIOCHIM BIOPHYS ACTA
ABELES R H	1971	5	481	ENZYMES
ABELES R H	1961	236	2347	J BIOL CHEM
ABELES R H	1966	241	1245	J BIOL CHEM
ABELES R H	1966	9	686	METHOD ENZYMOL
ABELES R H	1979		373	VITAMIN B12
ANTON D L	1980	102	2215	J AM CHEM SOC
ANTON D L	1980	255	4507	J BIOL CHEM
BABIOR B M	1988	1	21	BIOFACTORS
BABIOR B M	1974	249	1689	J BIOL CHEM
BACHOVCHIN W W	1977	16	1082	BIOCHEMISTRY-US
BACHOVCHIN W W	1978	17	2218	BIOCHEMISTRY-US
BONT J A M	1982	714	465	BIOCHIM BIOPHYS ACTA
BROWNSTEIN A M	1961	236	1199	J BIOL CHEM
COCKLE S A	1972	94	275	J AM CHEM SOC
DANIEL R	1992	100	281	FEMS MICROBIOL LETT
EAGAR R G	1975	14	5523	BIOCHEMISTRY-US
EBERHARD G	1988	369	1091	BIOL CHEM HOPPESEYLE
ESSENBERG M K	1971	93	1242	J AM CHEM SOC
FINKE R G	1984	54	1	COORDIN CHEM REV
FINLAY T H	1972	247	4197	J BIOL CHEM
FINLAY T H	1973	248	1285	J BIOL CHEM
FORAGE R G	1979	569	249	BIOCHIM BIOPHYS ACTA
FORAGE R G	1982	149	413	J BACTERIOL
FORAGE R G	1982	151	591	J BACTERIOL
FREY P A	1967	29	873	BIOCHEM BIOPH RES CO
FREY P A	1970	92	4488	J AM CHEM SOC
FREY P A	1966	241	2732	J BIOL CHEM
FREY P A	1967	242	5369	J BIOL CHEM
GOLDING B T	1982	1	543	B12
HALPERN J	1984	106	8317	J AM CHEM SOC
HARTMANIS M G N	1986	245	144	ARCH BIOCHEM BIOPHYS
HAY B P	1986	108	4820	J AM CHEM SOC
HAY B P	1987	109	8012	J AM CHEM SOC
HONDA S	1980	143	1458	J BACTERIOL
HOSOI N	1978	56	566	J FERMENT TECHNOL
ICHIKAWA M	1988	952	191	BIOCHIM BIOPHYS ACTA
ISHIDA A	1993	32	1535	BIOCHEMISTRY-US
ISHIDA A	1993	39	115	J NUTR SCI VITAMINOL
JENSEN F R	1975	62	816	BIOCHEM BIOPH RES CO
JOHNSON B C	1975	42	315	METHOD ENZYMOL
KROUWER J S	1980	612	153	BIOCHIM BIOPHYS ACTA
KUNO S	1980	205	240	ARCH BIOCHEM BIOPHYS
KUNO S	1981	210	474	ARCH BIOCHEM BIOPHYS
KUNO S	1981	211	722	ARCH BIOCHEM BIOPHYS
KUNO S	1990	277	211	ARCH BIOCHEM BIOPHYS
LEE H A	1963	238	2367	J BIOL CHEM
MCGEE D E	1982	108	547	BIOCHEM BIOPH RES CO
MCGEE D E	1981	20	4293	BIOCHEMISTRY-US
MOORE K W	1979	87	1052	BIOCHEM BIOPH RES CO
OBRADORS N	1988	170	2159	J BACTERIOL
OCHIAI E I	1975	37	351	J INORG NUCL CHEM
PAWELKIEWICZ J	1965	12	207	ACTA BIOCHIM POL
PAWELKIEWICZ J	1964	112	703	ANN NY ACAD SCI
POZNANSKAJA A A	1979	194	379	ARCH BIOCHEM BIOPHYS
POZNANSKAYA A A	1977	484	236	BIOCHIM BIOPHYS ACTA
QUASTEL J H	1925	19	304	BIOCHEM J
RETEY J	1966	22	502	EXPERIENTIA
RETEY J	1966	22	72	EXPERIENTIA
SCHEPLER K L	1975	397	510	BIOCHIM BIOPHYS ACTA
SCHNEIDER Z	1966	14	7	B ACAD POL SCI
SCHNEIDER Z	1970	245	3388	J BIOL CHEM
SCHUTZ H	1984	139	366	ARCH MICROBIOL
SMILEY K L	1962	97	538	ARCH BIOCHEM BIOPHYS
SPRENGER G A	1989	135	1255	J GEN MICROBIOL <--
STROINSKI A	1974	162	321	ARCH BIOCHEM BIOPHYS
STROINSKI A	1979		1029	VITAMIN B12
TALARICO T L	1990	56	1195	APPL ENVIRON MICROB
TANIZAWA K	1987	42	353	Z NATURFORSCH C
TOBIMATSU T				UNPUB
TONG I T	1991	57	3541	APPL ENVIRON MICROB
TORAYA T	1980	203	174	ARCH BIOCHEM BIOPHYS
TORAYA T	1985	242	470	ARCH BIOCHEM BIOPHYS
TORAYA T	1976	69	475	BIOCHEM BIOPH RES CO
TORAYA T	1971	10	3475	BIOCHEMISTRY-US
TORAYA T	1974	13	3895	BIOCHEMISTRY-US
TORAYA T	1975	14	3949	BIOCHEMISTRY-US
TORAYA T	1979	18	417	BIOCHEMISTRY-US
TORAYA T	1988	27	7677	BIOCHEMISTRY-US
TORAYA T	1972	284	536	BIOCHIM BIOPHYS ACTA
TORAYA T	1982	2	233	B12
TORAYA T	1977	76	285	EUR J BIOCHEM
TORAYA T				IN PRESS BIOCH BIOPH
TORAYA T	1978	135	726	J BACTERIOL
TORAYA T	1979	139	39	J BACTERIOL
TORAYA T	1980	141	1439	J BACTERIOL
TORAYA T	1977	252	963	J BIOL CHEM
TORAYA T	1980	255	3520	J BIOL CHEM
TORAYA T	1983	258	9296	J BIOL CHEM
TORAYA T	1986	261	9289	J BIOL CHEM
TORAYA T	1987	262	8544	J BIOL CHEM
TORAYA T	1991	266	5430	J BIOL CHEM
TORAYA T				UNPUB
USHIO K	1984	788	318	BIOCHIM BIOPHYS ACTA
USHIO K	1982	28	225	J NUTR SCI VITAMINOL
VALINSKY J E	1974	96	4709	J AM CHEM SOC
VALINSKY J E	1974	249	2751	J BIOL CHEM
VOISENET C E	1918	32	476	ANN I PASTEUR
WAGNER O W	1966	241	1751	J BIOL CHEM
WILLETTS A	1979	588	302	BIOCHIM BIOPHYS ACTA
YAKUSHEVA M I	1974	60	293	ANAL BIOCHEM
YAKUSHEVA M I	1977	484	216	BIOCHIM BIOPHYS ACTA
YAMANE T	1966	113	362	ARCH BIOCHEM BIOPHYS
ZAGALAK B	1964	11	49	ACTA BIOCHIM POL
ZAGALAK B	1965	12	103	ACTA BIOCHIM POL
ZAGALAK B	1965	12	219	ACTA BIOCHIM POL
ZAGALAK B	1968	16	67	B ACAD POL SCI
ZAGALAK B	1966	241	3028	J BIOL CHEM

L20 ANSWER 8 OF 9 SCISEARCH COPYRIGHT 1997 ISI (R) AN 93:17810 SCISEARCH
GA The Genuine Article (R) Number: KE540
TI GROWTH TEMPERATURE-DEPENDENT ACTIVITY OF GLYCEROL DEHYDRATASE IN ESCHERICHIA-COLI EXPRESSING THE CITROBACTER-FREUNDII DHA REGULON
AU DANIEL R; GOTTSCHALK G (Reprint)
CS UNIV GOTTINGEN, INST MIKROBIOL, GRISEBACHSTR 8, W-3400 GOTTINGEN, GERMANY CYA GERMANY
SO FEMS MICROBIOLOGY LETTERS, (15 DEC 1992) Vol. 100, No. 1-3, pp. 281-285. ISSN: 0378-1097. DT Article; Journal FS LIFE LA ENGLISH REC Reference Count: 13
AB Using the cosmid pWE15, a genomic library of Citrobacter freundii DNA in Escherichia coli ECL707 was prepared and screened for glycerol utilization. Six out of approximately 3000 clones were positive. One clone, harboring the recombinant cosmid pRD1, expressed glycerol dehydratase in high activity when grown at 28-degrees-C but not at 37-degrees-C. The growth temperature had little effect on the activity of the other enzymes encoded by the dha regulon. When the glycerol-containing medium was supplemented with corrinoids, the recombinant E. coli strain produced 1,3-propanediol in high amounts at 28-degrees-C.

CC MICROBIOLOGY
ST Author Keywords: CITROBACTER-FREUNDII; ESCHERICHIA-COLI ECL707; GLYCEROL DEHYDRATASE; 1,3-PROPANEDIOL; GLYCEROL FERMENTATION; DHA REGULON
STP KeyWords Plus (R): KLEBSIELLA-PNEUMONIAE; ANAEROBIC GROWTH; GENES RF 92-3056 001; UPTAKE OF SURFACTANT PROTEIN-B; CASEIN KINASE-II; CATALYTIC SUBUNITS 92-4812 001; PUTATIVE ANAEROBIC COPROPORPHYRINOGEN-III OXIDASE IN RHODOBACTER-SPHAEROIDES; TRANSCRIPTIONAL REGULATORY ELEMENT; FUNCTIONAL EXPRESSION RE Referenced Author |Year | VOL | PG | Referenced Work
(RAU) |(RPY)|(RVL)|(RPG) | (RWK)

BOENIGK R	1991			THESIS GEORG AUGUST
BRADFORD M M	1976	72	248	ANAL BIOCHEM
EGGSTEIN M	1974			METHODEN ENZYMATISCH
JETER R M	1984	159	206	J BACTERIOL
JOHNSON E A	1984	160	55	J BACTERIOL
MARMUR J	1961	3	208	J MOL BIOL
PFENNIG N	1966	55	245	ARCH MIKROBIOL
RUCH F E	1974	119	50	J BACTERIOL
SAMBROOK J	1989			MOL CLONING
SPRENGER G A	1989	135	1255	J GEN MICROBIOL <--
TONG I T	1991	57	3541	APPL ENVIRON MICROB
TORAYA T	1977	76	285	EUR J BIOCHEM
TORAYA T	1977	252	963	J BIOL CHEM

L20 ANSWER 9 OF 9 SCISEARCH COPYRIGHT 1997 ISI (R) AN 91:670800 SCISEARCH
GA The Genuine Article (R) Number: GT942
TI 1,3-PROPANEDIOL PRODUCTION BY ESCHERICHIA-COLI EXPRESSING GENES FROM THE KLEBSIELLA-PNEUMONIAE-DHA REGULON
AU TONG I T; LIAO H H; CAMERON D C (Reprint)
CS UNIV WISCONSIN, DEPT CHEM ENGN, 1415 JOHNSON DR, MADISON, WI, 53706;
UNIV WISCONSIN, CTR BIOTECHNOL, MADISON, WI, 53705 CYA USA
SO APPLIED AND ENVIRONMENTAL MICROBIOLOGY, (1991) Vol. 57, No. 12, pp. 3541-3546. DT Article; Journal FS LIFE; AGRI LA ENGLISH REC Reference Count: 33
AB The dha regulon in Klebsiella pneumoniae enables the organism to grow anaerobically on glycerol and produce 1,3-propanediol (1,3-PD). Escherichia coli, which does not have a dha system, is unable to grow anaerobically on glycerol without an exogenous electron acceptor and does not produce 1,3-PD. A genomic library of K. pneumoniae ATCC 25955 constructed in E. coli AG1 was enriched for the ability to grow anaerobically on glycerol and dihydroxyacetone and was screened for the production of 1,3-PD. The cosmid pTC1 (42.5 kb total with an 18.2-kb major insert) was isolated from a 1,3-PD-producing strain of E. coli and found to possess enzymatic activities associated with four genes of the dha regulon: glycerol dehydratase (dhaB), 1,3-PD oxidoreductase (dhaT), glycerol dehydrogenase (dhaD), and dihydroxyacetone kinase (dhaK). All four activities were inducible by the presence of glycerol. When E. coli AG1/pTC1 was grown on complex medium plus glycerol, the yield of 1,3-PD from glycerol was 0.46 mol/mol. The major fermentation by-products were formate, acetate, and D-lactate. 1,3-PD is an intermediate in organic synthesis and polymer production. The 1,3-PD fermentation provides a useful model system for studying the interaction of a biochemical pathway in a foreign host and for developing strategies for metabolic pathway engineering.
CC MICROBIOLOGY; BIOTECHNOLOGY & APPLIED MICROBIOLOGY STP KeyWords Plus (R): GLYCEROL; DISSIMILATION; DEHYDRATASES; COENZYME; KINASE RF 91-1515 001; PHYSICAL MAP OF THE ESCHERICHIA-COLI CHROMOSOME; METZ GENE ENCODING TRANSFER-RNA MET F1; ASC (FORMERLY SAC) OPERON RE Referenced Author |Year | VOL | PG | Referenced Work
(RAU) |(RPY)|(RVL)|(RPG) | (RWK)

AUSUBEL F M	1987			CURRENT PROTOCOLS MO
BAILEY J E	1991	252	1668	SCIENCE
CAMERON D C	1990			J P CORN UT C ST LOU
COZZARELLI N R	1965	90	1325	J BACTERIOL
DANIELS L	1975	90	1325	APPL BACTERIOL
ELM R	1980	19	425	ULLMANNS ENCY TECHNI
FORAGE R G	1979	569	249	BIOCHIM BIOPHYS ACTA
FORAGE R G	1982	149	413	J BACTERIOL
FORAGE R G	1982	151	591	J BACTERIOL
HONDA S	1980	143	1458	J BACTERIOL
JOHNSON E A	1984	160	55	J BACTERIOL
JOHNSON E A	1985	164	479	J BACTERIOL
JOHNSON E A	1987	169	2050	J BACTERIOL
LIN E C C	1976	30	535	ANNU REV MICROBIOL
LIN E C C	1960	235	1820	J BIOL CHEM
LJUNGDAHL L G	1986		84	MANUAL IND MICROBIOL
MACQUITTY J J	1988	362	11	ACS SYM SER
MORRIS D W	1981	1	27	DNA CELL BIOL
PAWELKIEWICZ J	1965	12	207	ACTA BIOCHIM POL
RICHEY D P	1972	112	784	J BACTERIOL
RUCH F E	1974	119	50	J BACTERIOL
SCHNEIDER Z	1966	13	311	ACTA BIOCHIM POL
SPRENGER G A	1989	135	1255	J GEN MICROBIOL <--
SRIDHARA S	1969	98	87	J BACTERIOL
STROINSKI A	1974	162	321	ARCH BIOCHEM BIOPHYS
TEMPEST D W	1987		797	ESCHERICHIA COLI SAL
TORAYA T	1982		233	B12 BIOCH MED
TORAYA T	1977	252	963	J BIOL CHEM
ZWAIG N	1970	102	753	J BACTERIOL

STN Patent No. |Year |Ref. Inventor/Assignee |Type |Ref. Patent No.
(RPN) |(RPY)| (RIN) | | (RPN)

US 2465319	1949	WHINFIELD J R		US 2465319
US 4873379	1989	MURPHY M A		US 4873379
US 4937314	1990	GREENE R N		US 4937314

DIALOG INFORMATION SERVICES

09dec97 12:47:19 User208600 Session D1120.1

File 301:CHEMNAME(R) 1957-1997/Nov (c) 1997 Amer.Chem.Soc.

S1 1 GLYCEROL(W)DEHYDRATASE
S2 1 DIOL(W)DEHYDRATASE

SYSTEM:OS - DIALOG OneSearch
File 155:MEDLINE(R) 1966-1997/Dec W4 (c) format only 1997 Knight-Ridder Info
File 5:BIOSIS PREVIEWS(R) 1969-1997/Dec W1 (c) 1997 BIOSIS
File 73:EMBASE 1974-1997/Nov W3 (c) 1997 Elsevier Science B.V.
File 351:DERWENT WPI 1963-1997/UD=9748;UP=9745;UM=9743 (c)1997 Derwent Info Ltd

Set Items Description
S1 240 ADENOSYLCOBALAMIN()DEPENDENT()DIOL()DEHYDRASE + COENZYME() B12()DEPENDENT()DIOL()DEHYDRASE + COENZYME()B12()DEPENDENT()DIOL()DEHYDRATASE + DEHYDRATASE()DIOL + DIOL()DEHYDRASE + DIOL()DEHYDRATASE + MESO()2()3()BUTANEDIOL()DEHYDRASE
S2 117 PROPANEDIOL()DEHYDRASE + PROPANEDIOL()DEHYDRATASE + 1()2()PROPANEDIOL()DEHYDRATASE
S3 280 S1:S2
S4 191 COENZYME()B12()DEPENDENT()GLYCEROL()DEHYDRATASE + GLYCEROL()DEHYDRASE + GLYCEROL()DEHYDRATASE
S5 156571 KLEBSIELLA OR CITROBACTER OR LACTOBACILLUS OR ENTEROBACTEROR PELOBACTER OR ILYOBACTER OR CLOSTRIDIUM
S6 138 S3 AND S5
S7 105 RD (unique items)
S8 90 S4 AND S5 NOT S6
S9 64 RD (unique items)

7/6/1 (Item 1 from file: 155) 09142159 97296406
Kinetic investigations with inhibitors that mimic the posthomolysis intermediate in the reactions of coenzyme-B12-dependent glycerol dehydratase and diol dehydratase.

7/6/2 (Item 2 from file: 155) 08960494 97157051
An electron paramagnetic resonance study on the mechanism-based inactivation of adenosylcobalamin-dependent diol dehydrase by glycerol and other substrates.

7/6/3 (Item 3 from file: 155) 08791004 96394290
Cloning, sequencing, and high level expression of the genes encoding adenosylcobalamin-dependent glycerol dehydrase of Klebsiella pneumoniae.

7/6/4 (Item 4 from file: 155) 08790962 96422012
Cloning, sequencing, and overexpression of the genes encoding coenzyme B12-dependent glycerol dehydratase of Citrobacter freundii.

7/6/5 (Item 5 from file: 155) 08213743 95221362
Molecular cloning, sequencing, and expression of the genes encoding adenosylcobalamin-dependent diol dehydrase of Klebsiella oxytoca.

7/6/6 (Item 6 from file: 155) 07662694 94015511
Importance of the nucleotide loop moiety coordinated to the cobalt atom of adenosylcobalamin for coenzymic function in the diol dehydrase reaction.

7/6/7 (Item 7 from file: 155) 07487018 93160191
Adenosylcobinamide methyl phosphate as a pseudocoenzyme for diol dehydrase.

7/6/8 (Item 8 from file: 155) 06454075 90165470
Essential histidine residues in coenzyme B12-dependent diol dehydrase: dye-sensitized photooxidation and ethoxycarbonylation.

7/6/9 (Item 9 from file: 155) 06216664 87092400
Solubilization of a membrane-bound diol dehydratase with retention of EPR g = 2.02 signal by using 2-(N-cyclohexylamino)ethanesulfonic acid buffer.

7/6/10 (Item 10 from file: 155) 06148838 87265998
Re-investigation of the protein structure of coenzyme B12-dependent diol dehydrase.

7/6/11 (Item 11 from file: 155) 06130099 86129441
Diol metabolism and diol dehydratase in Clostridium glycolicum.

7/6/12 (Item 12 from file: 155) 06086412 88107822
Roles of the beta-D-ribofuranose ring and the functional groups of the D-ribose moiety of adenosylcobalamin in the diol dehydratase reaction.

7/6/13 (Item 13 from file: 155) 05575726 89207091
[Studies on the biolgical function of the nucleotide base of vitamin B12] Untersuchungen zur biolgischen Funktion der Nucleotidbase von Vitamin B12.

7/6/14 (Item 14 from file: 155) 05554022 88198006
Anaerobic metabolism of the L-rhamnose fermentation product 1,2-propanediol in Salmonella typhimurium.

7/6/15 (Item 15 from file: 155) 05314924 87250467
Activation and cleavage of the carbon-cobalt bond of adeninylethylcobalamin by diol dehydrase.

7/6/16 (Item 16 from file: 155) 05279470 86250875
The synthesis of adenine-modified analogs of adenosylcobalamin and their coenzymic function in the reaction catalyzed by diol dehydrase.

7/6/17 (Item 17 from file: 155) 04855866 86049396
The binding site for the adenosyl group of coenzyme B12 in diol dehydrase.

7/6/18 (Item 18 from file: 155) 04410929 80182104
The synthesis and properties of four spin-labeled analogs of adenosylcobalamin.

7/6/19 (Item 19 from file: 155) 03879299 82066866
Chemical modification of coenzyme B12-dependent diol dehydrase with pyridoxal 5'-phosphate: lysyl residue essential for interaction between two components of the enzyme.

7/6/20 (Item 20 from file: 155) 03841000 83074700
Diol dehydratase: N-terminal amino acid sequences and subunit stoichiometry.

7/6/21 (Item 21 from file: 155) 03837227 83032742
The mechanism of in sutu reactivation of glycerol-inactivated coenzyme B12-dependent enzymes, glycerol dehydratase and diol dehydratase.

7/6/22 (Item 22 from file: 155) 03818946 82119943
Glycerol fermentation in Klebsiella pneumoniae: functions of the coenzyme B12-dependent glycerol and diol dehydratases.

7/6/23 (Item 23 from file: 155) 03817061 82099691
[The molecular basis of manifestation of function for vitamin B12 coenzymes (author's transl)]

7/6/24 (Item 24 from file: 155) 03814098 82066743
Reactive sulfhydryl groups of coenzyme B12-dependent diol dehydrase: differential modification of essential and nonessential ones.

7/6/25 (Item 25 from file: 155) 03810110 82023979
Purification and subunit characterization of propanediol dehydratase, a membrane-associated enzyme.

7/6/26 (Item 26 from file: 155) 03790172 81085020
Coenzyme B12-dependent diol dehydrase: chemical modification with 2,3-butanedione and phenylglyoxal.

7/6/27 (Item 27 from file: 155) 03783569 81006730
In situ reactivation of glycerol-inactivated coenzyme B12-dependent enzymes, glycerol dehydratase and diol dehydratase.

7/6/28 (Item 28 from file: 155) 03782938 80264192
Inactivation of dioldehydrase in the presence of a coenzyme-B12 analog.

7/6/29 (Item 29 from file: 155) 03775514 80159971
The synthesis of several immobilized derivatives of vitamin B12 coenzyme and their use as affinity adsorbents for a study of interactions of diol dehydrase with the coenzyme.

7/6/30 (Item 30 from file: 155) 03775503 80159893
Distribution of coenzyme B12-dependent diol dehydratase and glycerol dehydratase in selected genera of Enterobacteriaceae and Propionibacteriaceae.

7/6/31 (Item 31 from file: 155) 03260264 79231445
Stereospecificity and mechanism of adenosylcobalamin-dependent diol dehydratase. Catalysis and inactivation with meso- and dl-2,3-butanediols as substrates.

7/6/32 (Item 32 from file: 155) 03115235 79124674
Role of peripheral side chains of vitamin B12 coenzymes in the reaction catalyzed by dioldehydrase.

7/6/33 (Item 33 from file: 155) 03108208 78242158
Coenzyme B12-dependent diol dehydratase: regulation of apoenzyme synthesis in Klebsiella pneumoniae (Aerobacter aerogenes) ATC 8724.

7/6/34 (Item 34 from file: 155) 02985254 77225263
Immunochemical evidence for the difference between coenzyme-B12-dependent diol dehydratase and glycerol dehydratase.

7/6/35 (Item 35 from file: 155) 02963505 80000580
Resolution of the coenzyme B-12-dependent dehydratases of Klebsiella sp. and Citrobacter freundii.

7/6/36 (Item 36 from file: 155) 02963490 80000417
Hydrogen transfer in catalysis by adenosylcobalamin-dependent diol dehydratase.

7/6/37 (Item 37 from file: 155) 02959767 79216215
Fermentation of 1,2-propanediol with 1,2-ethanediol by some genera of Enterobacteriaceae, involving coenzyme B12-dependent diol dehydratase.

7/6/38 (Item 38 from file: 155) 02956999 79186157
Coenzyme B12-dependent diol dehydrase: purification, subunit heterogeneity, and reversible association.

7/6/39 (Item 39 from file: 155) 02908486 77134713
Mechanism of action of adenosylcobalamin: glycerol and other substrate analogues as substrates and inactivators for propanediol dehydratase--kinetics, stereospecificity, and mechanism.

7/6/40 (Item 40 from file: 155) 02907797 77118572
Studies on the mechanism of the adenosylcobalamin-dependent diol dehydrase reaction by the use of analogs of the coenzyme.

7/6/41 (Item 41 from file: 155) 02313562 75146954
Preparation, properties and biological activities of succinyl derivatives of vitamin B12.

7/6/42 (Item 42 from file: 155) 02143923 76184142
Substrate specificity of coenzyme B12-dependent diol dehydrase: glycerol as both a good substrate and a potent inactivator.

7/6/43 (Item 43 from file: 155) 02058873 76039896
Immobilized diol dehydrase and its use in studies of cobalamin binding and subunit interaction.

7/6/44 (Item 44 from file: 155) 02002592 75146949
Ethanolamine ammonia-lyase: inactivation of the holoenzyme by N2O and the mechanism of action of Coenzyme B12.

7/6/45 (Item 45 from file: 155) 01430076 75008121
Coenzyme B12 dependent diol dehydrase system. Dissociation of the enzyme into two different protein components and some properties of the components.

7/6/46 (Item 46 from file: 155) 01317779 74031427
Activation of diol dehydrase by formamidinium or guanidinium ion, polyatomic monovalent cations having sp2 nitrogen.

7/6/47 (Item 47 from file: 155) 01276156 73196460
Dissociation of diol dehydrase nto two different protein components.

7/6/48 (Item 48 from file: 155) 01201378 73047392
Coenzyme B 12 -dependent propanediol dehydratase systems. Ternary complex between apoenzyme, coenzyme, and substrate analog.

7/6/49 (Item 49 from file: 155) 01158359 72238147
Coenzyme B 12 dependent propanediol dehydratase system. Nature of cobalamin binding and some properties of apoenzyme-coenzyme B 12 analog complexes.

7/6/50 (Item 50 from file: 155) 00961699 72040213
Propanediol dehydratase system. Role of monovalent cations in binding of vitamin B 12 coenzyme or its analogs to apoenzyme.

7/6/51 (Item 51 from file: 155) 00495878 70000235
Ternary complex formation of 1,2-propanediol dehydratase, cobamide coenzyme and substrate analogue.

7/6/52 (Item 52 from file: 155) 00227137 68011874
Coenzyme activity of 5'-chlorocobalamin (10-Cl-DBCC) in propanediol dehydratase system.

7/6/53 (Item 53 from file: 155) 00143034 67173019
[On the mechanism of the propanediol dehydrase reaction] Zum Mechanismus der Propandioldehydrase-Reaktion.

7/6/54 (Item 54 from file: 155) 00102610 67052680
[On the stereochemistry of the propanediol dehydrase reaction] Zur Stereochemie der Propandioldehydrase-Reaktion.

7/6/55 (Item 1 from file: 5) 13011721 BIOSIS Number: 99011721
Carbon and electron flow in Clostridium butyricum grown in chemostat ulture on glycerol and on glucose Print Number: Biological Abstracts Vol. 102 Iss. 001 Ref. 011721

7/6/56 (Item 2 from file: 5) 11049541 BIOSIS Number: 97249541
Diol dehydrase and glycerol dehydrase, coenzyme B-12-dependent isozymes Print Number: Biological Abstracts/RRM Vol. 046 Iss. 006 Ref. 082721

7/6/57 (Item 3 from file: 5) 11049540 BIOSIS Number: 97249540
Diol dehydrase from Clostridium glycolicum: The non-B-12-dependent enzyme Print Number: Biological Abstracts/RRM Vol. 046 Iss. 006 Ref. 082720

7/6/58 (Item 4 from file: 5) 11049533 BIOSIS Number: 97249533
Metal Ions in Biological Systems, Vol. 30. Metalbenzymes involving amino acid-residue and related radicals Print Number: Biolgical Abstracts/RRM Vol. 046 Iss. 006 Ref. 082713

7/6/59 (Item 5 from file: 5) 9567450 BIOSIS Number: 94072450
ENZYMES INVOLVED IN ANAEROBIC POLYETHYLENE GLYCOL DEGRADATION BY PELOBACTER-VENETIANUS AND BACTEROIDES STRAIN PG1

7/6/60 (Item 6 from file: 5) 5816885 BIOSIS Number: 83079192
SOLUBILIZATION OF A MEMBRANE-BOUND DIOL DEHYDRATASE WITH RETENTION OF EPR G EQUALS 2.02 SIGNAL BY USING 2-N CYCLOHEXYLAMINOETHANESULFONIC ACID BUFFER

7/6/61 (Item 7 from file: 5) 5447256 BIOSIS Number: 82092059
CHARACTERIZATION OF THE ENZYME INVOLVED IN FORMATION OF 2 BUTANOL FROM MESO-2 3 BUTANEDIOL BY LACTIC-ACID BACTERIA

7/6/62 (Item 8 from file: 5) 5150605 BIOSIS Number: 31039920
SOLUBILIZATION OF MEMBRANE-BOUND AND OXYGEN SENSITIVE ENZYMES WITH 2-N CYCLOHEXYLAMINOETHANESULFONIC-ACID

7/6/63 (Item 9 from file: 5) 5104752 BIOSIS Number: 30117059
SOLUBILIZATION OF DIOL DEHYDRATASE FROM CLOSTRIDIUM-GLYCOLICUM

7/6/64 (Item 10 from file: 5) 4792137 BIOSIS Number: 79034452
COENZYMIC FUNCTION OF 1 SUBSTITUTED OR N-6 SUBSTITUTED ANALOGS OF ADENOSYLCOBALAMIN IN THE DIOL DEHYDRATASE EC-4.2.1.28 REACTION

7/6/65 (Item 11 from file: 5) 4650225 BIOSIS Number: 29007540
DIOL DEHYDRATASE AND GLYCOL METABOLISM IN CLOSTRIDIUM-GLYCOLICUM

7/6/66 (Item 12 from file: 5) 4440303 BIOSIS Number: 78014126
LIGAND EXCHANGE REACTIONS OF DIOL DEHYDRASE EC-4.2.1.28 BOUND COBALAMINS AND THE EFFECT OF THE NUCLEOSIDE BINDING

7/6/67 (Item 13 from file: 5) 4071486 BIOSIS Number: 76021337
DIOL DEHYDRATASE EC-4.2.1.28 N TERMINAL AMINO-ACID SEQUENCES AND SUBUNIT STOICHIOMETRY

7/6/68 (Item 14 from file: 5) 4027710 BIOSIS Number: 75075069
THE MECHANISM OF IN-SITU REACTIVATION OF GLYCEROL INACTIVATED COENZYME B-12 DEPENDENT ENZYMES GLYCEROL DEHYDRATASE EC-4.2.1.30 AND DIOL DEHYDRATASE EC-4.2.1.28

7/6/69 (Item 15 from file: 5) 3664154 BIOSIS Number: 73056521
REACTIVE SULFHYDRYL GROUPS OF COENZYME B-12 DEPENDENT DIOL DEHYDRASE EC-4.2.1.28 DIFFERENTIAL MODIFICATION OF ESSENTIAL AND NONESSENTIAL ONES

7/6/70 (Item 16 from file: 5) 3642292 BIOSIS Number: 73034659
PURIFICATION AND SUBUNIT CHARACTERIZATION OF PROPANEDIOL DEHYDRATASE EC-4.2.1.28 A MEMBRANE ASSOCIATED ENZYME

7/6/71 (Item 17 from file: 5) 3318561 BIOSIS Number: 71040960
COENZYME B-12 DEPENDENT DIOL DEHYDRASE EC-4.2.1.28 CHEMICAL MODIFICATION WITH 2 3 BUTANEDIONE AND PHENYL GLYOXAL

7/6/72 (Item 18 from file: 5) 3237789 BIOSIS Number: 21030192
STRUCTURE FUNCTION RELATIONSHIP OF VITAMIN B-12 COENZYME ADENOSYL COBALAMIN IN THE DIOL DEHYDRASE EC-4.2.1.28 SYSTEM

7/6/73 (Item 19 from file: 5) 3086882 BIOSIS Number: 70036789
THE SYNTHESIS OF SEVERAL IMMOBILIZED DERIVATIVES OF VITAMIN B-12 COENZYME AND THEIR USE AS AFFINITY ADSORBENTS FOR A STUDY OF INTERACTIONS OF DIOL
DEHYDRASE EC-4.2.1.28 WITH THE COENZYME

7/6/74 (Item 20 from file: 5) 2974674 BIOSIS Number: 69012081
FERMENTATION OF 1 2 PROPANEDIOL AND 1 2 ETHANEDIOL BY SOME GENERA OF ENTEROBACTERIACEAE INVOLVING COENZYME B-12 DEPENDENT DIOL DEHYDRATASE
EC-4.2.1.28

7/6/75 (Item 21 from file: 5) 2801475 BIOSIS Number: 68056382
COENZYME B-12 DEPENDENT DIOL DEHYDRASE EC-4.2.1.28 PURIFICATION SUBUNIT HETEROGENEITY AND REVERSIBLE ASSOCIATION

7/6/76 (Item 22 from file: 5) 2788680 BIOSIS Number: 68043587
STEREOSPECIFICITY AND MECHANISM OF ADENOSYL COBALAMIN DEPENDENT DIOL DEHYDRATASE CATALYSIS AND INACTIVATION WITH MESO 2 3 BUTANEDIOL AND RACEMIC
2 3 BUTANEDIOL AS SUBSTRATES

7/6/77 (Item 23 from file: 5) 2756523 BIOSIS Number: 68011430
ROLE OF PERIPHERAL SIDE CHAINS OF VITAMIN B-12 COENZYMES IN THE REACTION CATALYZED BY DIOL DEHYDRASE EC-4.2.1.28

7/6/78 (Item 24 from file: 5) 2684235 BIOSIS Number: 67021638
METABOLISM OF 1 2 PROPANEDIOL BY METHANOL UTILIZING BACTERIA AND SOME PROPERTIES OF 1 2 PROPANEDIOL DEHYDROGENATING ENZYME

7/6/79 (Item 25 from file: 5) 2526149 BIOSIS Number: 66073054
COENZYME B-12 DEPENDE NT DIOL DEHYDRATASE EC-4.2.1.28 REGULATION OF APOENZYME SYNTHESIS IN KLEBSIELLA-PNEUMONIAE AEROBACTER-AEROGENES ATCC-8724

7/6/80 (Item 26 from file: 5) 2501151 BIOSIS Number: 66048056
MECHANISM OF ACTION OF ADENOSYL COBALAMIN HYDROGEN TRANSFER IN THE INACTIVATION OF DIOL DEHYDRATASE EC-4.2.1.28 BY GLYCEROL

7/6/81 (Item 27 from file: 5) 2377808 BIOSIS Number: 65004216
IMMUNOCHEMICAL EVIDENCE FOR THE DIFFERENCE BETWEEN COENZYME B-12 DEPENDENT DIOL DEHYDRATASE EC-4.2.1.28 AND GLYCEROL DEHYDRATASE EC-4.2.1.30

7/6/82 (Item 28 from file: 5) 2183678 BIOSIS Number: 64010598
MECHANISM OF ACTION OF ADENOSYL COBALAMIN GLYCEROL AND OTHER SUBSTRATE ANALOGS AS SUBSTRATES AND INACTIVATORS FOR PROPANEDIOL DEHYDRATASE
EC-4.2.1.28 KINETICS STEREOSPECIFICITY AND MECHANISM

7/6/83 (Item 29 from file: 5) 2166587 BIOSIS Number: 63071007
STUDIES ON THE MECHANISM OF THE ADENOSYL COBALAMIN DEPENDENT DIOL DEHYDRASE EC-4.2.1.28 REACTION BY THE USE OF ANALOGS OF THE COENZYME

7/6/84 (Item 30 from file: 5) 1721539 BIOSIS Number: 60066107
A PHYSICAL EXPLANATION OF THE EPR SPECTRUM OBSERVED DURING CATALYSIS BY ENZYMES UTILIZING COENZYME B-12

7/6/85 (Item 31 from file: 5) 1677514 BIOSIS Number: 60022082
ETHANOL AMINE AMMONIA LYASE INACTIVATION OF THE HOLO ENZYME BY NITROGEN OXIDE AND THE MECHANISM OF ACTION OF COENZYME B-12

7/6/86 (Item 32 from file: 5) 1671435 BIOSIS Number: 60016003
RELATIVE ENANTIOMER BINDING AND REACTION RATES WITH PROPANEDIOL DEHYDRASE EC-4.2.1.28

7/6/87 (Item 33 from file: 5) 1083898 BIOSIS Number: 55013830
FORMATION OF 5 DEOXYADENOSYL DERIVATES OF COBALAMIN C LACTAM AND COBALAMIN C LACTONE BY PROPIONIBACTERIUM-SHERMANII IN-VIVO AND IN-VITRO

7/6/88 (Item 1 from file: 73) 10002807 EMBASE No: 96181477
Evidence for enantiomorphic-enantiotopic group discrimination in diol dehydratase-catalyzed dehydration of meso-2,3-butanediol

7/6/89 (Item 2 from file: 73) 9133324 EMBASE No: 94072716
The synthesis of a pyridyl an alog of adenosylcobalamin and its coenzymic function in the diol dehydratase reaction

7/6/90 (Item 3 from file: 73) 8280211 EMBASE No: 91302965
Roles of the D-ribose and 5,6-dimethylbenzimidazole moieties of the nucleotide loop of adenosylcobalamin in manifestation of coenzymic functionin the diol dehydrase reaction

7/6/91 (Item 4 from file: 73) 7247646 EMBASE No: 88247524
Acceleration of cleavage of th e carbon-cobalt bond of sterically hindered alkylcobalamins by binding to apoprotein of diol dehydrase

7/6/92 (Item 5 from file: 73) 6031502 EMBASE No: 86026562
The binding site for the adenosyl group of coenzyme Bsub 1sub 2 in diol dehydrase

7/6/93 (Item 6 from file: 73) 5754272 EMBASE No: 84249938
Propanediol-1,2-dehydratase and metabolism of glycerol of Lactobacillus brevis

7/6/94 (Item 7 from file: 73) 5710823 EMBASE No: 84206489
Coenzymic function of 1- or Nsup 6-substituted analogs of adenosylcobalamin in the diol dehydratase reaction

7/6/95 (Item 8 from file: 73) 5125653 EMBASE No: 82130576
Glycerol fermentation in Klebsiella pneumoniae: Functions of the coenzyme Bsub 1sub 2-dependent glycerol and diol dehydratases

7/6/96 (Item 9 from file: 73) 2260075 EMBASE No: 81031200
In situ reactivation of glyc erol-inactivated coenzyme Bsub 1sub2-dependent enzymes, glycerol dehydratase and diol dehydratase

7/6/97 (Item 10 from file: 73) 1232941 EMBASE No: 79000296
Coenzyme Bsub 1sub 2- depe ndent diol dehydratase: regulation of apoenzymesynthesis in Klebsiella pneumoniae (Aerobacter aerogenes) ATCC 8724

7/6/98 (Item 11 from file: 73) 949780 EMBASE No: 78117989
Immunochemical evidence for the difference between coenzyme Bsub 1sub 2 dependent diol dehydratase and glycerol dehydratase

7/6/99 (Item 12 from file: 73) 616302 EMBASE No: 76203083
Mechanism of action of adenosylcobalamin: 3 fluoro 1,2 propanediol as substrate for propanediol dehydrase. Mechanistic implications

7/6/100 (Item 13 from file: 73) 556098 EMBASE No: 76140982
Coenzyme action of adenosyl 13 epicobalamin in the diol dehydrase system

7/6/101 (Item 14 from file: 73) 537094 EMBASE No: 76121511
A physical explanation of the EPR spectrum observed during catalysis by enzymes utilizing coenzyme Bsub 1sub 2

7/6/102 (Item 15 from file: 73) 427247 EMBASE No: 76007141
Relative enantiomer binding and reaction rates with propanediol dehydrase

7/6/103 (Item 16 from file: 73) 326271 EMBASE No: 75119035
Coenzyme Bsub 1sub 2 dependent diol dehydrase system. Dissociation of the enzyme into two different protein components and some properties of the components

7/6/104 (Item 1 from file: 351) 011021737 WPI Acc No: 96-518587/199651
Fermentative prodn. of 1,3-propane-diol useful for polymer prodn. - from carbon substrates using mixed culture of glycerol-producing and diol-producing organisms

7/6/105 (Item 2 from file: 351) 011021733 WPI Acc No: 96-518683/199651
Cosmid contg. Klebsiella pneumoniae gene for diol dehydratase - and related transformed microorganisms able to convert glycerol to 1,3-propanediol for polymer prodn

7/7/3 (Item 3 from file: 155) DIALOG(R)File 155:MEDLINE(R) (c) format only 1997 Knight-Ridder Info. All rts. reserv.
08791004 96394290
Cloning, sequencing, and high level expression of the genes encoding adenosylcobalamin-dependent glycerol dehydrase of Klebsiella pneumoniae.
Tobimatsu T; Azuma M; Matsubara H; Takatori H; Niida T; Nishimoto K; Satoh H; Hayashi R; Toraya T
Department of Bioscience and Biotechnology, Faculty of Engineering, Okayama University, Tsushima-Naka, Okayama 700, Japan.
J Biol Chem (UNITED STATES) Sep 13 1996, 271 (37) p22352-7, ISSN 0021-9258 Journal Code: HIV Languages: ENGLISH Document type: JOURNAL ARTICLE
The gld genes encoding adenosylcobalamin-dependent glycerol dehydrase of Klebsiella pneumoniae were cloned by cross-hybridization with a DNA fragment of Klebsiella oxytoca diol dehydrase genes. Since the Escherichia coli clones isolated did not show appreciable enzyme activity, plasmids for high level expression of cloned genes were constructed. The enzyme expressed in E. coli was indistinguishable from the wild-type glycerol dehydrase of K. pneumoniae by the criteria of polyacrylamide gel electrophoretic, immunochemical, and catalytic properties. It was also shown that the recombinant functional enzyme consists of Mr 61,000, 22,000, and 16, 000 subunits. Sequence analysis of the genes revealed four open reading frames separated by 2-12 bases. The sequential three open reading frames from the first to the third (gldA, gldB, and gldC genes) encoded polypeptides of 555, 194, and 141 amino acid residues with predicted molecular weights of 60,659(alpha), 21,355(beta), and 16,104(gamma),respectively. High level expression of these three genes in E. coli produced more than 14-fold higher level of fully active apoenzyme than that in K. pneumoniae. It was thus concluded that these are the genes encoding the subunits of glycerol dehydrase. The deduced amino acid sequences of the three subunits were 71, 58, and 54% identical with those of the alpha, beta, and gamma subunits of diol dehydrase, respectively, but failed to show any apparent homology with other proteins.

7/7/4 (Item 4 from file: 155) DIALOG(R)File 155:MEDLINE(R) (c) format only 1997 Knight-Ridder Info. All rts. reserv.
08790962 96422012
Cloning, sequencing, and overexpression of the genes encoding coenzyme B12-dependent glycerol dehydratase of Citrobacter freundii.
Seyfried M; Daniel R; Gottschalk G
Institut fur Mikrobiologie der Georg-August-Universitat, Gottingen, Germany.
J Bacteriol (UNITED STATES) Oct 1996, 178 (19) p5793-6, ISSN 0021-9193 Journal Code: HH3 Languages: ENGLISH Document type: JOURNAL ARTICLE
The genes encoding coenzyme B12-dependent glycerol dehydratase of Citrobacter freundii were cloned and overexpressed in Escherichia coli. The B12-free enzyme was purified to homogeneity. It consists of three types of subunits whose N-terminal sequences are in accordance with those deduced from the open reading frames dhaB, dhaC, and dhaE, coding for subunits of 60,433 (alpha), 21,487 (beta), and 16,121 (gamma) Da, respectively. The enzyme complex has the composition alpha2beta2gamma2. Amino acid alignments with the subunits of the recently sequenced diol dehydratase of Klebsiella oxytoca (T. Tobimatsu, T. Hara, M. Sakaguchi, Y. Kishimoto, Y. Wada, M. Isoda, T. Sakai, and T. Toraya, J. Biol. Chem. 270:7142-7148, 1995) revealed identities between 51.8 and 70.9%.

7/7/5 (Item 5 from file: 155) DIALOG(R)File 155:MEDLINE(R) (c) format only 1997 Knight-Ridder Info. All rts. reserv.
08213743 95221362
Molecular cloning, sequencing, and expression of the genes encoding adenosylcobalamin-dependent diol dehydrase of Klebsiella oxytoca.
Tobimatsu T; Hara T; Sakaguchi M; Kishimoto Y; Wada Y; Isoda M; Sakai T; Toraya T
Department of Biotechnology, Faculty of Engineering, Okayama University, Japan.
J Biol Chem (UNITED STATES) Mar 31 1995, 270 (13) p7142-8, ISSN 0021-9258 Journal Code: HIV Languages: ENGLISH Document type: JOURNAL ARTICLE
The pdd genes encoding adenosylcobalamin-dependent diol dehydrase of Klebsiella oxytoca were cloned by using a synthetic oligodeoxyribonucleotide as a hybridization probe followed by measuring the enzyme activity of each clone. Five clones of Escherichia coli exhibited diol dehydrase activity. At least one of them was shown to express diol dehydrase genes under control of their own promoter. Sequence analysis of the DNA fragments found in common in the inserts of these five clones and the flanking regions revealed four open reading frames separated by 10-18 base pairs. The sequential three open reading frames from the second to the fourth (pddA, pddB, and pddC genes) encoded polypeptides of 554, 224, and 173 amino acid residues with predicted molecular weights of 60,348 (alpha), 24,113 (beta), and 19,173 (gamma), respectively. Overexpression of these three genes in E. coli produced more than 50-fold higher level of functional apodiol dehydrase than that in K. oxytoca. The recombinant enzyme was indistinguishable from the wild-type one of K. oxytoca by the criteria of polyacrylamide gel electrophoretic and immunochemical properties. It was thus concluded that these three gene products are the subunits of functional diol dehydrase. Comparisons of the deduced amino acid sequences of the three subunits with other proteins failed to reveal any apparent homology.

7/7/11 (Item 11 from file: 155) DIALOG(R)File 155:MEDLINE(R) (c) format only 1997 Knight-Ridder Info. All rts. reserv.
06130099 86129441
Diol metabolism and diol dehydratase in Clostridium glycolicum.
Hartmanis MG; Stadtman TC
Arch Biochem Biophys (UNITED STATES) Feb 15 1986, 245 (1) p144-52, ISSN 0003-9861 Journal Code: 6SK Languages: ENGLISH Document type: JOURNAL ARTICLE

Levels of the five enzymes involved in the fermentation of 1,2-ethanediol and 1,2-propanediol in the strictly anaerobic bacterium, Clostridium glycolicum, were investigated. All enzymes with the exception of the first enzyme in the pathway, diol dehydratase, were found to be constitutive, stable to exposure to oxygen, and present in the cytosol. Diol dehydratase was found to be extremely oxygen sensitive and strongly associated with the cell membrane. Treatment with ionic and nonionic detergents, butanol, phospholipase A2, or osmotic shock procedures failed to solubilize any diol dehydratase activity. Limited proteolysis using subtilisin released small amounts of activity. Diol dehydratase was found to be specific for 1,2-ethanediol and 1,2-propanediol and required the addition of a reducing agent for maximal activity. The enzyme was strongly inhibited by low concentrations of EDTA, ethylene glycol bis(beta-aminoethyl ether)-N,N,N',N'-tetraacetic acid, o-phenanthroline, hydroxylamine, hydroxyurea, and sulfhydryl reagents. Addition of adenosylcobalamin or high levels of intrinsic factor did not affect the reaction rate. Irradiation with light also did not inhibit the enzyme activity. These results suggest that the catalytic mechanism of diol dehydratase from C. glycolicum does not involve a cobamide coenzyme.

7/7/22 (Item 22 from file: 155) DIALOG(R)File 155:MEDLINE(R) (c) format only 1997 Knight-Ridder Info. All rts. reserv.
03818946 82119943
Glycerol fermentation in Klebsiella pneumoniae: functions of the coenzyme B12-dependent glycerol and diol dehydratases.
Forage RG; Foster MA
J Bacteriol (UNITED STATES) Feb 1982, 149 (2) p413-9, ISSN 0021-9193 Journal Code: HH3 Languages: ENGLISH Document type: JOURNAL ARTICLE
Glycerol and diol dehydratases are inducible, coenzyme B12-dependent enzymes found together in Klebsiella pneumoniae ATCC 25955 during anaerobic growth on glycerol. Mutants of this strain isolated by a novel procedure were separately constitutive for either dehydratase, showing the structural genes for the two enzymes to be under independent control in vivo. Glycerol dehydratase and a trimethylene glycol dehydrogenase were implicated as members of a pleiotropic control system that includes glycerol dehydrogenase and dihydroxyacetone kinase for the anaerobic dissimilation of glycerol (the "dha system"). The dehydratase and dehydrogenases were induced by dihydroxyacetone and were jointly constitutive in mutants isolated as constitutive for either the dha system or glycerol dehydratase. These data and the stimulation of growth by Co2+ suggested that glycerol dehydratase and trimethylene glycol dehydrogenase are obligatory enzymes for anaerobic growth on glycerol as the sole carbon source.

7/7/56 (Item 2 from file: 5) DIALOG(R)File 5:BIOSIS PREVIEWS(R) (c) 1997 BIOSIS. All rts. reserv.
11049541 BIOSIS Number: 97249541
Diol dehydrase and glycerol dehydrase, coenzyme B-12-dependent isozymes
Toraya T
Dep. Biotechnol., Fac. Eng., Okayama Univ., 3-1-1 Tsushima-Naka, Okayama 700, JAP 0 (0). 1994. 217-254. Full Journal Title: Sigel, H. and A. Sigel (Ed.). Metal Ions in Biological Systems, Vol. 30. Metalloenzymes involving amino acid-residue and related radicals. xxxv+494p.
Marcel Dekker, Inc.: New York, New York, USA; Basel, Switzerland. ISBN 0-8247-9093-6. ISSN: 0161-5149 Language: ENGLISH Print Number: Biological Abstracts/RRM Vol. 046 Iss. 006 Ref. 082721

7/7/57 (Item 3 from file: 5) DIALOG(R)File 5:BIOSIS PREVIEWS(R) (c) 1997 BIOSIS. All rts. reserv.
11049540 BIOSIS Number: 97249540
Diol dehydrase from Clostridium glycolicum: The non-B-12-dependent enzyme
Hartmanis M G N
Kabi Pharmacia BioSci. Cent., Strandhergsgatan 49, S-11287 Stockholm, SWE 0 (0). 1994. 201-215.
Full Journal Title: Sigel, H. and A. Sigel (Ed.). Metal Ions in Biological Systems, Vol. 30. Metalloenzymes involving amino acid-residue and related radicals. xxxv+494p. Marcel Dekker, Inc.: New York, New York, USA; Basel, Switzerland. ISBN 0-8247-9093-6. ISSN: 0161-5149 Language: ENGLISH Print Number: Biological Abstracts/RRM Vol. 046 Iss. 006 Ref. 082720

7/7/58 (Item 4 from file: 5) DIALOG(R)File 5:BIOSIS PREVIEWS(R) (c) 1997 BIOSIS. All rts. reserv.
11049533 BIOSIS Number: 97249533
Metal Ions in Biological Systems, Vol. 30. Metalloenzymes involving amino acid-residue and related radicals
Sigel H; Sigel A
Inst. Inorg. Chem., Univ. Basel, CH-4056 Basel, SWI 0 (0). 1994. XXXV+494P. Full Journal Title: Sigel, H. and A. Sigel (Ed.). Metal Ions in Biological Systems, Vol. 30. Metalloenzymes involving amino acid-residue and related radicals. xxxv+494p. Marcel Dekker, Inc.: New York, New York, USA; Basel, Switzerland. ISBN 0-8247-9093-6. ISSN: 0161-5149
Language: ENGLISH Print Number: Biological Abstracts/RRM Vol. 046 Iss. 006 Ref. 082713
This book contains 13 papers discussing metalloenzymes involving amino acid-residue and related radicals. Some of the topics covered include free radical sites and their locations, mechanistic considerations, and enzymes that depend on the metals manganese, iron, cobalt, and copper. The work will be useful for researchers and students in chemistry, biochemistry, biophysics, enzymology, molecular biology, etc. Graphs, diagrams, tables, and charts illustrate the text.

7/7/59 (Item 5 from file: 5) DIALOG(R)File 5:BIOSIS PREVIEWS(R)(c) 1997 BIOSIS. All rts. reserv.
9567450 BIOSIS Number: 94072450
ENZYMES INVOLVED IN ANAEROBIC POLYETHYLENE GLYCOL DEGRADATION BY PELOBACTER-VENETIANUS AND BACTEROIDES STRAIN PG1
FRINGS J; SCHRAMM E; SCHINK B
FAKULTAET FUER BIOLOGIE DER UNIVERSITAET KONSTANZ, POSTFACH 5560, D-7750 KONSTANZ, GERMANY.
APPL ENVIRON MICROBIOL 58 (7). 1992. 2164-2167. CODEN: AEMID Full Journal Title: Applied and Environmental Microbiology Language: ENGLISH
In extracts of polyethylene glyucol (PEG)-grown cells of the strictly anaerobically fermenting bacterium Pelobacter venetianus, two different enzyme activities were detected, a diol dehydratase and a PEG-degrading enzyme which was characterized as a PEG acetaldehyde lyase. Both enzymes were oxygen sensitive and depended on a reductant, such as titanium citrate or sulfhydryl compounds, for optimal activity. The diol dehydratase was inhibited by various corrinoids (adenosylcobalamin, cyanocobalamin, hydroxocobalamin, and methylcobalamin) by up to 37% at a concentration of 100 .mu.M. Changes in ionic strength and the K+ ion concentration had only limited effects on this enzyme activity; glycerol inhibited the enzyme by 95%. The PEG-degrading enzyme activity was stimulated by the same corrinoids by up to 80%, exhibited optimal activity in 0.75 M potassium phosphate buffer or in the presence of 4 M KCl, and was only slightly affected by glycerol. Both enzymes were located in the cytoplasmic space. Also, another PEG-degrading bacterium, Bacteroides strain PG1, contained a PEG acetaldehyde lyase activity analogous to the corresponding enzyme of P. venetianus but no diol dehydratase. Our results confirm that corrinoid-influenced PEG degradation analogous to a diol dehydratase reaction is a common strategy among several different strictly anaerobic PEG-degrading bacteria.

7/7/74 (Item 20 from file: 5) DIALOG(R)File 5:BIOSIS PREVIEWS(R) (c) 1997 BIOSIS. All rts. reserv.
2974674 BIOSIS Number: 69012081
FERMENTATION OF 1 2 PROPANEDIOL AND 1 2 ETHANEDIOL BY SOME GENERA OF ENTEROBACTERIACEAE INVOLVING COENZYME B-12 DEPENDENT DIOL DEHYDRATASE EC-4.2.1.28
TORAYA T; HONDA S; FUKUI S
LAB. IND. BIOCHEM., DEP. IND. CHEM., FAC. ENG., KYOTO UNIV., SAKYO, KYOTO 606, JPN.
J BACTERIOL 139 (1). 1979. 39-47. CODEN: JOBAA Full Journal Title: Journal of Bacteriology Language: ENGLISH
Klebsiella pneumoniae (Aerobacter aerogenes) ATCC 8724 grew anaerobically on 1,2-propanediol and 1,2-ethanediol as C and energy sources. Whole cells of the bacterium grown anarobically n 1,2-propanediol or on glycerol catalyzed conversion of 1,2-diols and aldehydes on the corresponding acidsand alcohols. Glucose-grown cells also converted aldehydes, but not 1,2-diols, to acids and alcohols. The presence of activities of coenzyme B12-dependent diol dehydratase, alcohol dehydrogenase, Co-A-dependent aldehyde dehydrogenase, phosphotransacetylase and acetate kinase was demonstrated with crude extracts of 1,2-propanediol-grown cells. The dependence of the levels of these enzymes on growth substrates, together with cofactor requirements in in vitro conversion of these substrates, indicates that 1,2-diols are fermented to the corresponding acids and alcohols via aldehydes, acyl-CoA and acyl phosphates. This metabolic pathway for 1,2-diol fermentation was also suggested in some other genera of Enterobacteriaceae which grew anaerobically on 1,2-propanediol. When the bacteria were cultivated in a 1,2-propanediol medium not supplemented with cobalt ion, the coenzyme B12-dependent conversion of 1,2-diols to aldehydes was the rate-limiting step in this fermentation. This was because the ntracellular concentration of coenzyme B12 was very low in the cells grown in cobalt-deficient medium, since the apoprotein of diol dehydratase was markedly induced in the cells grown in the 1,2-propanediol medium. Better cell yields were obtained when the bacteria were grown anaerobically on 1,2-propanediol. Aerobically grown cells evidently have a different metabolic pathway for utilizing 1,2-propanediol.

7/7/105 (Item 2 from file: 351) DIALOG(R)File 351:DERWENT WPI (c)1997 Derwent Info Ltd. All rts. reserv.
011021733 WPI Acc No: 96-518683/199651
Cosmid contg. Klebsiella pneumoniae gene for diol dehydratase - and related transformed microorganisms able to convert glycerol to 1,3-propanediol for polymer prodn
Patent Assignee: DU PONT DE NEMOURS & CO E I (DUPO)
Inventor: NAGARAJAN V; NAKAMURA C E
Number of Countries: 061 Number of Patents: 003
Patent Family:
Patent No Kind Date Applicat No Kind Date Main IPC Week
WO 9635795 A1 19961114 WO 96US6163 A 19960502 C12N-015/60 199651 B
AU 9657229 A 19961129 AU 9657229 A 19960502 C12N-015/60 199712
US 5633362 A 19970527 US 95440377 A 19950512 C07H-021/02 199727
Priority Applications (No Type Date): US 95440377 A 19950512
Cited Patents: 9. journal ref.
Patent Details:
Patent Kind Lan Pg Filing Notes Application Patent
WO 9635795 A1 E 48
Designated States (National): AL AU BB BG BR CA CN CZ EE GE HU IS JP KPKR LK LR LT LV MG MK MN MX NO NZ PL RO SG SI SK TR TT UA US UZ VN
Designated States (Regional): AT BE CH DE DK EA ES FI FR GB GR IE IT KE LS LU MC MW NL OA PT SD SE SZ UG

AU 9657229 A Based on WO 9635795
US 5633362 A 18
Abstract (Basic): WO 9635795 A

Cosmid (A) comprises a DNA fragment (I) of about 35 kb from Klebsiella pneumoniae that encodes an active diol dehydratase enzyme (II).

USE - Cells transformed with (I) or (A) can convert glycerol to 1,3-propanediol (IV) which is a monomer potentially useful for prodn. of polyester fibre, polyurethanes and cyclic cpds..

ADVANTAGE - This method provides efficient, cost effective and environmentally acceptable prodn. of (IV).

Dwg.0/4

Abstract (Equivalent): US 5633362 A

A cosmid comprising a DNA fragment of about 35 kb isolated from Klebsiella pneumoniae wherein said fragment encodes an active diol dehydratase enzyme having the restriction digest in FIG. 5, columns numbered 4, said cosmid contained within a transformed E. coli deposited with the American Type Culture Collection under accession number ATCC 69790. (Fig 5 not suitable for reproduction) Dwg.0/0

Derwent Class: A41; D16; E17; F01
International Patent Class (Main): C07H-021/02; C12N-015/60
International Patent Class (Additional): C07H-021/04; C12N-001/19; C12N-001/21; C12N-009/04; C12N-009/88; C12N-015/53; C12N-015/74; C12N-015/79; C12P-007/18

9/6/1 (Item 1 from file: 155) 09265995 97457194
Glycerol conversion to 1,3-p ropanediol by Clostridium pasteurianum:cloning and expression of the gene encoding 1,3-propanediol dehydrogenase.

9/6/2 (Item 2 from file: 155) 09229632 97388589
Anaerobic pathways of glycerol dissimilation by Enterobacter agglomerans CNCM 1210: limitations and regulations.

9/6/3 (Item 3 from file: 155) 08016680 94377734
Phenotypic diversity of anaerobic glycerol dissimilation shown by seven enterobacterial species.

9/6/4 (Item 4 from file: 155) 07313946 93122543
Growth temperature-dependent activity of glycerol dehydratase in Escherichia coli expressing the Citrobacter freundii dha regulon.

9/6/5 (Item 5 from file: 155) 07070352 92121087
Sugar-glycerol cofermentations in lactobacilli: the fate of lactate.

9/6/6 (Item 6 from file: 155) 06924196 92152855
1,3-Propanediol production by Escherichia coli expressing genes from the Klebsiella pneumoniae dha regulon.

9/6/7 (Item 7 from file: 155) 05901057 90155202
Anaerobic growth of Escher ichia coli on glycerol by importing genes of the dha regulon from Klebsiella pneumoniae.

9/6/8 (Item 8 from file: 155) 05308385 87194586
Klebsiella pneumoniae 1,3-propanediol NAD+ oxidoreductase.

9/6/9 (Item 9 from file: 155) 03838735 83049313
[Coenzyme properties of adenosylcobalamin analogs with modifications in the purine nucleus of the alpha-ligand] Kofermentnye svoistva analogov adenozilkobalamina s izmenennym purinovym iadrom alfa-liganda.

9/6/10 (Item 10 from file: 155) 03825037 82183110
[Substrate specificity of ad enosylcobalamin-dependent glycerol dehydratase. Interaction with enantiomers of 1,2-propanediol] Substratnaia spetsifichnost' adenozi kobalaminzavisimoi glitseroldegidrat azy. Vzaimodeistvie s enantiomerami 1,2-propandiola.

9/6/11 (Item 11 from file: 155) 03151140 77065853
[Effect of environmental factors on inactivation of B12-dependent glycerol dehydratase from Aerobacter aerogenes] Vlianie faktorov sredy na inaktivatsiiu B12-zavisimoi glitseroldegidratazy iz Aerobacter aerogenes

9/6/12 (Item 12 from file: 155) 03134432 75174520
Glycerol dehydratase from Aerobacter aerogenes.

9/6/13 (Item 13 from file: 155) 02620573 79062639
[Effect of the structure of the nucleoside ligand of cobalamines on their enzymatic properties in a glycerol dehydratase system] Vlianie struktury nukleozidnogo liganda kobalaminov na ikh kofermentnye svoistva v sisteme glitseroldegidratazy.

9/6/14 (Item 14 from file: 155) 02491634 78061052
[9-(Adenylyl)alkylcobalamins as inhibitors of adenosylcobalamin-dependent glycerol dehydratase from Aerobacter aerogenes] 9-(Adenilil)Alkilkobalaminy kak ingibitory adenozilkobalamin-zavisimoi glitseroldegidratazy iz Aerobacter aerogenes.

9/6/15 (Item 15 from file: 155) 02449780 77242443
Study of the mechanism of action of adenosylcobalamindependent glycerol dehydratase from Aerobacter aerogenes. II. The inactivation kinetics of glycerol dehydratase complexes with adenosylcobalamin and its analogs.

9/6/16 (Item 16 from file: 155) 02449779 77242442
Study on the mechanism of action of adenosylcobalamin-dependent glycerol dehydratase from Aerobacter aerogenes. I. Role of structural components of adenosylcobalamin the formation of the active site of glycerol dehydratase.

9/6/17 (Item 17 from file: 155) 02079984 76089220
[Role of monovalent cations in reactions catalyzed by glycerol dehydrase from Aerobacter aerogenes]

9/6/18 (Item 18 from file: 155) 01807381 74300091
Determination of glycerol dehydratase activity by the coupled enzymic method.

9/6/19 (Item 19 from file: 155) 01802219 74150185
[Determination of glycerol dehydratase activity by the method of coupled enzyme reactions] Opredelenie aktivnosti glitseroldegidratazy metodom sopriazheniia fermentativnykh reaktsii.

9/6/20 (Item 20 from file: 155) 01472942 75134080
[Study of purine analogs of cobamide coezyme in a glycerol dehydratase system from aerobacter aerogenes] Izuchenie purinovykh analogov kobamidnogo kofermenta v sisteme glitseroldegidratazy iz aerobacter aerogenes

9/6/21 (Item 21 from file: 155) 01424920 74269724
Allosteric interactions in glycerol dehydratase. Purification of enzyme and effects of positive and negative cooperativity for glycerol.

9/6/22 (Item 22 from file: 155) 01336562 74080757
[Formation of glycerol dehydratase by a culture of Aerobacter aerogenes, its partial purification and various properties] Obrazovanie glitseroldegidratazy kulturoi Aerobacter aerogenes, ee
chastichnaia ochistka i nekotorye svoistva.

9/6/23 (Item 23 from file: 155) 01244861 75002999
[Kinetics of irreversible inactivation of holoenzyme and enzyme-substrate complexes of glycerol dehydratase] Kinetika neobratimoi inaktivatsii kholofermenta i fermentsubstratnykh kompleksov glitseroldegidratazy

9/6/24 (Item 24 from file: 155) 01209238 73067771
[Kinetics of the transformation of 1,2-propanediol to propionic aldehyde, atalyzed by glycerol dehydratase from Aerobacter aerogenes] Kinetika prevrashcheniia 1,2-propandiola v propionovyi al'degid, kataliziruemogo glitseroldegidratazoi iz Aerobacter aerogenes.

9/6/25 (Item 25 from file: 155) 01103372 70293158
Purification and properties of glycerol dehydrase.

9/6/26 (Item 26 from file: 155) 01081824 68277312
Mechanism of action of coenzyme B12-dependent glycerol dehydratase.

9/6/27 (Item 27 from file: 155) 00218268 67257076
Enzymatic determination of vita min B12, coenzyme B12, and other cobamide derivatives in picomole quantities by means of glycerol dehydratase from Aerobacter aerogenes.

9/6/28 (Item 28 from file: 155) 00136925 67124546
The properties of glycerol dehydratase isolated from Aerobacter aerogenes, and the properties of the apoenzyme subunits.

9/6/29 (Item 1 from file: 5) 13582798 BIOSIS Number: 99582798
Biochemical and molecular characterization of coenzyme B-12-dependent glycerol dehydratase from Citrobacter freundii Print Number: Biological Abstracts/RRM Vol. 049 Iss. 007 Ref. 118404

9/6/30 (Item 2 from file: 5) 13333745 BIOSIS Number: 99333745
Physiologic mechanisms involved in accumulation of 3-hydroxypropionaldehyde during fermentation of glycerol by Enterobacteragglomerans Print Number: Biological Abstracts Vol. 103 Iss. 003 Ref. 036859

9/6/31 (Item 3 from file: 5) 12230210 BIOSIS Number: 98830210
Glycerol dehydratase activity: The limiting step for 1,3-propanediol production by Clostridium butyricum DSM 5431 Print Number: Biological Abstracts Vol. 101 Iss. 012 Ref. 180632

9/6/32 (Item 4 from file: 5) 10107492 BIOSIS Number: 95107492
FERMENTATION OF GLYC EROL TO 1 3 PROPANEDIOL IN CONTINUOUS CULTURES OF CITROBACTER-FREUNDII

9/6/33 (Item 5 from file: 5) 9107519 BIOSIS Number: 93092519
SUGAR GLYCEROL COFERMENTATIONS IN LACTOBACILLI THE FATE OF LACTATE

9/6/34 (Item 6 from file: 5) 7479751 BIOSIS Number: 89130770
UTILIZATION OF GLYCEROL AS A HYDROGEN ACCEPTOR BY LACTOBACILLUS-REUTERI PURIFICATION OF 1 3 PROPANEDIOL NAD OXIDOREDUCTASE

9/6/35 (Item 7 from file: 5) 7479748 BIOSIS Number: 89130767
PURIFICATION AND CHAR ACTERIZATION OF GLYCEROL DEHYDRATASE FROMLACTOBACILLUS-REUTERI

9/6/36 (Item 8 from file: 5) 4521051 BIOSIS Number: 78094874
ANAEROBIC REDUCTION OF GLYCEROL TO 1 3 PROPANEDIOL BY LACTOBACILLUS-BREVIS AND LACTOBACILLUS-BUCHNERI

9/6/37 (Item 9 from file: 5) 4402667 BIOSIS Number: 77077994
COBALT C CORRINOIDS THE DERIVATIVES OF VITAMIN B-12 PSEUDOFORMS AS CORRINOID ENZYME INHIBITORS

9/6/38 (Item 10 from file: 5) 4347088 BIOSIS Number: 77022415
SOME PHYSICOCHEMICAL FEATURES GLYCEROL DEHYDRATASE CATALYZED REACTIONS

9/6/39 (Item 11 from file: 5) 4343221 BIOSIS Number: 77018548
PRODUCTION OF 3 HYDROXY PROPIONALDEHYDE FROM GLYCEROL

9/6/40 (Item 12 from file: 5) 4167203 BIOSIS Number: 26019546
COENZYME PROPERTIES OF ADENOSYL COBALAMIN ANALOGS WITH A CHANGED PURINE NUCLEUS OF THE ALPHA LIGAND

9/6/41 (Item 13 from file: 5) 4079098 BIOSIS Number: 76028949
COENZYME PROPERTIES OF ADENOSYL COBALAMIN ANALOGS WITH MODIFICATIONS IN THE ALPHA LIGAND

9/6/42 (Item 14 from file: 5) 3847492 BIOSIS Number: 24054851
SUBSTRATE SPECIFICITY OF ADENOSYL COBALAMIN DEPENDENT GLYCEROL DEHYDRATASE EC-4.2.1.30 INTERACTION WITH ENANTIOMERS OF 1 2 PROPANEDIOL

9/6/43 (Item 15 from file: 5) 3693569 BIOSIS Number: 73085936
GLYCEROL FERMENTATIO N IN KLEBSIELLA-PNEUMONIAE FUNCTIONS OF THE COENZYMEB-12 DEPENDENT GLYCEROL AND DIOL DEHYDRATASES

9/6/44 (Item 16 from file: 5) 2974635 BIOSIS Number: 69012042
INTERACTION OF SUBSTRATES AND THEIR ANALOGS WITH ADENOSYL COBALAMIN DEPENDENT GLYCEROL DEHYDRATASE

9/6/45 (Item 17 from file: 5) 2944727 BIOSIS Number: 19049636
PARTICIPATION OF CYCLIC AMP IN REGULATION OF COENZYME B-12 DEPENDENTGLYCEROL DEHYDRATASE EC-4.2.1.30 SYNTHESIS FROM KLEBSIELLA-PNEUMONIAE ATCC-25955

9/6/46 (Item 18 from file: 5) 2944720 BIOSIS Number: 19049629
ADENOSYL COBALAMIN DE PENDENT GLYCEROL DEHYDRATASE EC-4.2.1.30 INTERACTION WITH SUBSTRATES AND THEIR ANALOGS

9/6/47 (Item 19 from file: 5) 2937208 BIOSIS Number: 19042117
ENZYMATIC ESTIMATION OF VITAMIN B-12

9/6/48 (Item 20 from file: 5) 2856392 BIOSIS Number: 18028803
INTERACTION OF SUBSTRA TES AND THEIR ANALOGS WITH ADENOSYL COBALAMIN DEPENDENT GLYCEROL DEHYDRATASE EC-4.2.1.30

9/6/49 (Item 21 from file: 5) 2835422 BIOSIS Number: 18007833
EFFECT OF STRUCTURE OF NUCLEOSIDE LIGAND OF COBALAMINS ON THEIR COENZYME PROPERTIES IN THE GLYCEROL DEHYDRATASE EC-4.2.1.30 SYSTEM

9/6/50 (Item 22 from file: 5) 2782252 BIOSIS Number: 68037159
EFFECT OF THE NUCLEOS IDE LIGAND STRUCTURE OF COBALAMINS ON THEIR COENZYMIC PROPERTIES IN THE GLYCEROL DEHYDRATASE SYSTEM

9/6/51 (Item 23 from file: 5) 2775647 BIOSIS Number: 68030554
SEARCH FOR NEW MEDICINAL PREPARATIONS ON THE BASIS OF VITAMIN B-12 DERIVATIVES SYNTHESIS AND STUDY OF THE PHYSICOCHEMICAL AND COENZYME PROPERTIES OF ADENOSYL COBALAMIN DERIVATIVES

9/6/52 (Item 24 from file: 5) 2106317 BIOSIS Number: 63010737
THE ROLE OF E PROPANAMIDE GROUP OR THE CORRIN MACRO CYCLE IN THE MANIFESTATION OF COENZYMIC PROPERTIES OF THE COBAMIDE COENZYME

9/6/53 (Item 25 from file: 5) 1666115 BIOSIS Number: 60010683
STUDY OF PURINE ANALOGS OF THE COBAMIDE COENZYME IN THE GLYCEROL DEHYDRATASE SYSTEM FROM AEROBACTER-AEROGENES

9/6/54 (Item 1 from file: 73) 8406923 EMBASE No: 92083103
Sugar-glycerol cofermentations in lactobacilli: The fate of lactate

9/6/55 (Item 2 from file: 73) 6412604 EMBASE No: 87149266
Klebsiella pneumoniae 1,3-propanediol:NADsup + oxidoreductase

9/6/56 (Item 3 from file: 73) 1264966 EMBASE No: 79032619
Effects of the nucleoside lig nds structure of cobalamines on their coenzymic properties in glycerol dehydratase

9/6/57 (Item 4 from file: 73) 1000051 EMBASE No: 78170429
Study on the mechanism of action of adenosylcobalamin-dependent glycerol dehydratase from Aerobacter aerogenes. II. The inactivation kinetics of glycerol dehydratase complexes with adenosylcobalamin and its analogs

9/6/58 (Item 5 from file: 73) 1000050 EMBASE No: 78170428
Study on the mechanism of action of adenosylcobalamin-dependent glycerol dehydratase from Aerobacter aerogenes. I. Role of structural components of adenosylcobalamin in the formation of the active site of glycerol dehydratase

9/6/59 (Item 6 from file: 73) 859479 EMBASE No: 78025357
Influence of environmental factors on the inactivation of Bsub 1sub 2 dependent glycerol dehydratase from Aerobacter aerogenes

9/6/60 (Item 7 from file: 73) 630679 EMBASE No: 77007407
The role of monovalent cations in reactions catalyzed by glyceroldehydratase from Aerobacter aerogenes

9/6/61 (Item 8 from file: 73) 516161 EMBASE No: 93310393
Response to vasoactive ne uropeptides in basilar arteries isolated from stroke-prone spontaneously hypertensive rats

9/6/62 (Item 9 from file: 73) 466469 EMBASE No: 76048032
The interaction of apoglycero ldehydratase from Aerobacter aerogenes with 'apurine' analogs of cobamide coenzyme

9/6/63 (Item 10 from file: 73) 444734 EMBASE No: 76025321
Production of glycerol dehydratase by culture of Aerobacter aerogenes, its partial purification, and some properties

9/6/64 (Item 11 from file: 73) 372001 EMBASE No: 75167006
Investigation of purine analogues of the cobamide coenzyme in the glyceroldehydratase system from Aerobacter aerogenes (Russian)

9/7/1 (Item 1 from file: 155) DIALOG(R)File 155:MEDLINE(R) (c) format only 1997 Knight-Ridder Info. All rts. reserv.
09265995 97457194
Glycerol conversion to 1,3-propanediol by Clostridium pasteurianum: cloning and expression of the gene encoding 1,3-propanediol dehydrogenase.
Luers F; Seyfried M; Daniel R; Gottschalk G
Institut fur Mikrobiologie der Georg-August-Universitat, Gottingen, Germany.
FEMS Microbiol Lett (NETHERLANDS) Sep 15 1997, 154 (2) p337-45, ISSN 0378-1097 Journal Code: FML Languages: ENGLISH Document type: JOURNAL ARTICLE
When grown on glycerol as sole carbon and energy source, cell extracts of Clostridium pasteurianum exhibited activities of glycerol dehydrogenase, dihydroxyacetone kinase, glycerol dehydratase and 1,3-propanediol dehydrogenase. The genes encoding the latter two enzymes were cloned by colony hybridization using the dhaT gene of Citrobacter freundii as a heterologous DNA probe and expressed in Escherichia coli. The native molecular mass of 1,3-propanediol dehydrogenase (DhaT) is 440,000 Da. The dhaT gene of C. pasteurianum was subcloned and its nucleotide sequence (1158 bp) was determined. The deduced gene product (41,776 Da) revealed high similarity to DhaT of C. freundii (80.5% identity; 89.8% similarity).

9/7/4 (Item 4 from file: 155) DIALOG(R)File 155:MEDLINE(R) (c) format only 1997 Knight-Ridder Info. All rts. reserv.
07313946 93122543
Growth temperature-dependent activity of glycerol dehydratase in Escherichia coli expressing the Citrobacter freundii dha regulon.
Daniel R; Gottschalk G
Institute fur Mikrobiologie, Georg-August-Universitat, Gottingen, FRG.
FEMS Microbiol Lett (NETHERLANDS) Dec 15 1992, 79 (1-3) p281-5, ISSN 0378-1097 Journal Code: FML Languages: ENGLISH Document type: JOURNAL ARTICLE
Using the cosmid pWE15, a genomic library of Citrobacter freundii DNA in Escherichia coli ECL707 was prepared and screened for glycerol utilization. Six out of approximately 3000 clones were positive. One clone, harboring the recombinant cosmid pRD1, expressed glycerol dehydratase in high activity when grown at 28 degrees C but not at 37 degrees C. The growth temperature had little effect on the activity of the other enzymes encoded by the dha regulon. When the glycerol-containing medium was supplemented with corrinoids, the recombinant E. coli strain produced 1,3-propanediol in high amounts at 28 degrees C.

9/7/5 (Item 5 from file: 155) DIALOG(R)File 155:MEDLINE(R) (c) format only 1997 Knight-Ridder Info. All rts. reserv.
07070352 92121087
Sugar-glycerol cofermentations in lactobacilli: the fate of lactate.

Veiga da Cunha M; Foster MA
Department of Biochemistry, University of Oxford, United Kingdom.
J Bacteriol (UNITED STATES) Feb 1992, 174 (3) p1013-9, ISSN 0021-9193 Journal Code: HH3 Languages: ENGLISH Document type: JOURNAL ARTICLE

The simultaneous fermentation of glycerol and sugar by lactobacillus brevis B22 and Lactobacillus buchneri B190 increases both the growth rate and total growth. The reduction of glycerol to 1,3-propanediol by the lactobacilli was found to influence the metabolism of the sugar cofermented by channelling some of the intermediate metabolites (e.g., pyruvate) towards NADH-producing (rather than NADH-consuming) reactions. Ultimately, the absolute requirement for NADH to prevent the accumulation of 3-hydroxypropionaldehyde leads to a novel lactate-glycerol cofermentation. s a result, additional ATP can be made not only by (i) converting pyruvate to acetate via acetyl phosphate rather than to the ethanol usually found and (ii) oxidizing part of the intermediate pyruvate to acetate instead of the usual reduction to lactate but also by (iii) reoxidation of accumulated lactate to acetate via pyruvate. The conversion of lactate to pyruvate is probably catalyzed by NAD-independent lactate dehydrogenases that are found only in the cultures oxidizing lactate and producing 1,3-propanediol, suggesting a correlation between the expression of these enzymes and a raised intracellular NAD/NADH ratio. The enzymes metabolizing glycerol (glycerol dehydratase and 1,3-propanediol dehydrogenase) were expressed in concert without necessary induction by added glycerol, although their expression may also be influenced by the intracellular NAD/NADH ratio set by the different carbohydrates fermented.

9/7/8 (Item 8 from file: 155) DIALOG(R)File 155:MEDLINE(R) (c) format only 1997 Knight-Ridder Info. All rts. reserv.
05308385 87194586
Klebsiella pneumoniae 1,3-propanediol:NAD+ oxidoreductase.
Johnson EA; Lin EC
J Bacteriol (UNITED STATES) May 1987, 169 (5) p2050-4, ISSN 0021-9193 Journal Code: HH3 Contract/Grant No.: 5-R01-GM11983, GM, NIGMS Languages: ENGLISH Document type: JOURNAL ARTICLE

Fermentative utilization of glycerol, a more reduced carbohydrate than aldoses and ketoses, requires the disposal of the two extra hydrogen atoms. This is accomplished by sacrificing an equal quantity of glycerol via an auxiliary pathway initiated by glycerol dehydratase. The product, 3-hydroxypropionaldehyde, is then reduced by 1,3-propanediol NAD+:oxidoreductase (1,3-propanediol dehydrogenase; EC 1.1.1.202), resulting in the regeneration of NAD+ from NADH. The pathway for the assimilation of glycerol is initiated by an NAD-linked ehydrogenase. In Klebsiella pneumoniae the two pathways are encoded by the dha regulon whichis inducible only anaerobically. In this study 1,3-propanediol:NAD+ oxidoreductase was purified from cells grown anaerobically on glycerol. The enzyme was immunochemically distinct from the NAD-linked glycerol dehydrogenase and was an octamer or hexamer of a polypeptide of 45,000 +/- 3,000 daltons. When tested as a dehydrogenase, only 1,3-propanediol served as a substrate; no activity was detected with ethanol, 1-propanol, 1,2-propanediol, glycerol, or 1,4-butanediol. The enzyme was inhibited by chelators of divalent cations. An enzyme preparation inhibited by alpha,alpha'-dipyridyl was reactivated by the addition of Fe2+ or Mn2+ after removal of the chelator by gel filtration. As for glycerol dehydrogenase, 1,3-propanediol oxidoreductase is apparently inactivated by oxidation during aerobic metabolism, under which condition the enzyme becomes superfluous.

9/7/12 (Item 12 from file: 155) IALOG(R)File 155:MEDLINE(R) (c) format only 1997 Knight-Ridder Info. All rts. reserv.
03134432 75174520
Glycerol dehydratase from Aerobacter aerogenes.
Johnson BC; Stroinski A; Schneider Z
Methods Enzymol (UNITED STATES) 1975, 42 p315-23, ISSN 0076-6879 Journal Code: MVA Languages: ENGLISH Document type: JOURNAL ARTICLE

9/7/29 (Item 1 from file: 5) DIALOG(R)File 5:BIOSIS PREVIEWS(R) (c) 1997 BIOSIS. All rts. reserv.
13582798 BIOSIS Number: 99582798
Biochemical and molecular characterization of coenzyme B-12-dependent glycerol dehydratase from Citrobacter freundii
Daniel R; Seyfried M; Gottschalk G
Inst. Mikrobiol. Georg-August-Univ. Goettingen, Grisebachstr. 8, 37077 Goettingen, Germany
Abstracts of the General Meeting of the American Society for Microbiology 97 (0). 1997. 353. Full Journal Title: 97th General Meeting of the American Society for Microbiology, Miami Beach, Florida, USA, May 4-8, 1997. Abstracts of the General Meeting of the American Society for Microbiology ISSN: 1060-2011 Language: ENGLISH Print Number: Biological Abstracts/RRM Vol. 049 Iss. 007 Ref. 118404

9/7/31 (Item 3 from file: 5) DIALOG(R)File 5:BIOSIS PREVIEWS(R) (c) 1997 BIOSIS. All rts. reserv.
12230210 BIOSIS Number: 98830210
Glycerol dehydratase activity: The limiting step for 1,3-propanediol production by Clostridium butyricum DSM 5431
Abbad-Andaloussi S; Guedon E; Spiesser E; Petitdemange H
Lab. Chimie Biol. I, Univ. Henri Poincare Nancy I, BP 239, 54506 Vandoeuvre-les-Nancy Cedex, France
Letters in Applied Microbiology 22 (4). 1996. 311-314. Full Journal Title: Letters in Applied Microbiology ISSN: 0266-8254 Language: ENGLISH Print Number: Biological Abstracts Vol. 101 Iss. 012 Ref. 180632

Glycerol catabolism by Clostridium butyricum DSM 5431 into acetate, butyrate and 1,3-propanediol (1,3-PD) was studied in chemostat culture. The fact that the intracellular concentrations of NADH (18-22 mu-mol g-1 dry cell mass) were extremely high suggested that the dehydratase activity was the rate limiting step in 1,3-PD formation. This limitation was proved by the addition of propionaldehyde, another substrate of propanediol dehydrogenase, into the culture medium. This resulted in an increase in (i) glycerol utilization, (ii) biomass formation and (iii) product biosynthesis.

9/7/32 (Item 4 from file: 5) DIALOG(R)File 5:BIOSIS PREVIEWS(R) (c) 1997 BIOSIS. All rts. reserv.
10107492 BIOSIS Number: 95107492
FERMENTATION OF GLYCEROL TO 1 3 PROPANEDIOL IN CONTINUOUS CULTURES OF CITROBACTER-FREUNDII
BOENIGK R; BOWIEN S; GOTTSCHALK G
INSTITUT FUER MIKROBIOLOGIE, GEORG-AUGUST-UNIVERSITAET GOETTINGEN, GRISEBACHSTRASSE 8, W-3400 GOETTINGEN, GERMANY.
APPL MICROBIOL BIOTECHNOL 38 (4). 1993. 453-457. CODEN: AMBID Full Journal Title: Applied Microbiology and Biotechnology Language: ENGLISH

The conversion of glycerol to 1,3-propanediol by Citrobacter freundii DSM 30040 was optimized in single- or two-stage continuous cultures. The productivity of 1,3-propanediol formation was higher under glycerol limitation and increased with the dilution rate (D) to a maximum of 3.7 g .cntdot. 1-1 .cntdot. h-1. Glycerol dehydratase seemed to be the rate-limiting step in 1, 3-propane-diol formation. Conditions for the two-stage fermentation process were as follows: first stage, glycerol limitation (250 mM), pH 7.2, D = 0.1 h-1, 32.degree. C; second stage, additional glycerol, pH 6.6, D = 0.05 h-1, 28.degree. C. Under these conditions 876 mM glycerol were consumed, the final 1,3-propanediol concentrations was 5 mM, and the overall productivity. 1.38 g .cntdot. l-1 .cntdot. h-1.

9/7/33 (Item 5 from file: 5) DIALOG(R)File 5:BIOSIS PREVIEWS(R) (c) 1997 BIOSIS. All rts. reserv.
9107519 BIOSIS Number: 93092519
SUGAR GLYCEROL COFERMENTATIONS IN LACTOBACILLI THE FATE OF LACTATE
VEIGA DA CUNHA M; FOSTER M A
MICROBIOL. UNIT, DEP. BIOCHEM., UNIV. OXFORD, OXFORD OX1 3QU, UK.
J BACTERIOL 174 (3). 1992. 1013-1019. CODEN: JOBAA Full Journal Title: Journal of Bacteriology Language: ENGLISH

The simultaneous fermentation of glycerol and sugar by Lactobacillus brevis B22 and Lactobacillus buchneri B190 increases both the growth rate and total growth. The reduction of glycerol to 1,3-propanediol by the lactobacilli was found to influence the metabolism of the sugar cofermented by channelling some of the intermediate metabolites (e.g., pyruvate) towards NADH-producing (rather than NADH-consuming) reactions. Ultimately, the absolute requirement for NADH to prevent the accumulation of 3-hydroxypropionaldehyde leads to a novel lactate-glycerol cofermentation. As a result, additional ATP can be made not only by (i) converting pyruvate to acetate via acetyl phosphate rather than to the ethanol usually found and (ii) oxidizing part of the intermediate pyruvate to acetate instead of the usual reduction to lactate but also by (iii) reoxidation of accumulated lactate to acetate via pyruvate. The conversion of lactate to pyruvate is probably catalyzed by NAD-independent lactate dehydrogenases that are found only in the cultures oxidizing lactate and producing 1,3-propanediol, suggesting a correlation between the expression of these enzymes and a raised intracellular NAD/NADH ratio. The enzymes metabolizing glycerol (glycerol dehydratase and 1,3-propanediol dehydrogenase) were expressed in concert without necessary induction by added glycerol, although their expression may also be influenced by the intracellular NAD/NADH ratio set by the different carbohydrates fermented.

9/7/35 (Item 7 from file: 5) DIALOG(R)File 5:BIOSIS PREVIEWS(R) (c) 1997 BIOSIS. All rts. reserv.
7479748 BIOSIS Number: 89130767
PURIFICATION AND CHARACTERIZATION OF GLYCEROL DEHYDRATASE FROM LACTOBACILLUS-REUTERI
TALARICO T L; DOBROGOSZ W J
DEP. MICROBIOL., NORTH CAROLINA STATE UNIV., RALEIGH, N.C. 27695.
APPL ENVIRON MICROBIOL 56 (4). 1990. 1195-1197. CODEN: AEMID Full Journal Title: Applied and Environmental Microbiology Language: ENGLISH

A coenzyme B12-dependent glycerol dehydratase from Lactobacillus reuteri has been purified and characterized. The dehydratase has a molecular weight of approximately 200,000, and sodium dodecyl sulfate-polyacrylamide gel electrophoresis yielded a single major band with a molecular weight of 52,000. Km values for substrates and coenzyme B12 were in the millimolar and the submicromolar range, respectively.

9/7/36 (Item 8 from file: 5) DIALOG(R)File 5:BIOSIS PREVIEWS(R) c) 1997 BIOSIS. All rts. reserv.
4521051 BIOSIS Number: 78094874
ANAEROBIC REDUCTION OF GLYCEROL TO 1 3 PROPANEDIOL BY LACTOBACILLUS-BREVIS AND LACTOBACILLUS-BUCHNERI
SCHUETZ H; RADLER F
INSTITUT FUER MIKROBIOLOGIE UND WEINFORSCHUNG, UNIVERSITAET MAINZ, POSTFACH 3980, D-6500 MAINZ.
SYST APPL MICROBIOL 5 (2). 1984. 169-178. CODEN: SAMID Full Journal Title: Systematic and Applied Microbiology Language: ENGLISH

Three strains of L. brevis and 1 strain of L. buchneri grew very poorly on glucose. Good growth was observed on glucose plus glycerol; while glucose was fermented to acetate or ethanol, lactate and CO2, glycerol was dehydrated to 3-hydroxypropanal and subsequently reduced to 1,3-propanediol. Cell extracts of L. brevis and L. buchneri grown on glucose plus glycerol contained a B12-dependent glycerol dehydratase and a 1,3-propanediol dehydrogenase. Glycerol was not metabolized when used as the only substrate. Fructose as sole C source was partially reduced to mannitol. The joint fermentation of fructose and glycerol yielded 1,3-propanediol from glycerol. Ribose was fermented but did not support glycerol fermentation. Extracts from ribose grown cells did not contain glycerol dehydratase or 1,3-propanediol dehydrogenase. Besides glycerol the following diols were metabolized as cosubstrates with glucose: 1,2-propanediol, ethylene glycol and 2,3-butanediol yielding 1-propanol, ethanol and 2-butanol, respectively. Washed cells of 2 L. brevis strains B 18 and B 20 formed 1,3-propanediol and 1,2-propanediol from glycerol; the third strain, B 22, formed only 1,2-propanediol from glycerol in the absence of glucose.

9/7/38 (Item 10 from file: 5) DIALOG(R)File 5:BIOSIS PREVIEWS(R) (c) 1997 BIOSIS. All rts. reserv.
4347088 BIOSIS Number: 77022415
SOME PHYSICOCHEMICAL FEATURES GLYCEROL DEHYDRATASE CATALYZED REACTIONS
POZNANSKAYA A A; KOROSOVA T L
SCI.-PROD. ASSOC. "VITAM.", MOSCOW, USSR.
BIOKHIMIYA 48 (4). 1983. 539-543. CODEN: BIOHA Full Journal Title: Biokhimiya Language: RUSSIAN
The concentration of active centers in preparations of B12-dependent glycerol dehydratase from Klebsiella pneumoniae was determined by their titration with the coenzyme, adenosylcobalamine (AdoCbl). Some kinetic and thermodynamic features of the reactions catalyzed by the enzyme were established. The data obtained are indicative of a significant contribution of hydrophobic interactions to the substrate and AdoCbl binding to glycerol dehydratase.

9/7/54 (Item 1 from file: 73) DIALOG(R)File 73:EMBASE (c) 1997 Elsevier Science B.V. All rts. reserv.
8406923 EMBASE No: 92083103
Sugar-glycerol cofermentations in lactobacilli: The fate of lactate
Da Cunha M.V.; Foster M.A.
Microbiology Unit, Department of Biochemistry, University of Oxford, Oxford OX1 3QU United Kingdom
J. BACTERIOL. (USA), 1992, 174/3 (1013-1019) CODEN: JOBAA ISSN: 0021-9193 LANGUAGES: English
SUMMARY LANGUAGES: English
The simultaneous fermentation of glycerol and sugar by Lactobacillus brevis B22 and Lactobacillus buchneri B190 increases both the growth rate and total growth. The reduction of glycerol to 1,3-propanediol by the lactobacilli was found to influence the metabolism of the sugar cofermented by channelling some of the intermediate metabolites (e.g., pyruvate) towards NADH-producing (rather than NADH-consuming) reactions. Ultimately, the absolute requirement for NADH to prevent the accumulation of 3-hydroxypropionaldehyde leads to a novel lactate-glycerol cofermentation. As a result, additional ATP can be made not only by (i) converting pyruvate to acetate via acetyl phosphate rather than to the ethanol usually found and (ii) oxidizing part of the intermediate pyruvate to acetate instead of the usual reduction to lactate but also by (iii) reoxidation of accumulated lactate to acetate via pyruvate. The conversion of lactate to pyruvate is probably catalyzed by NAD-independent lactate dehydrogenases that are found only in the cultures oxidizing lactate and producing 1,3-propanediol, suggesting a correlation between the expression of these enzymes and a raised intracellular NAD/NADH ratio. The enzymes metabolizing glycerol (glycerol dehydratase and 1,3-propanediol dehydrogenase) were expressed in concert without necessary induction by added glycerol, although their expression may also be influenced by the intracellular NAD/NADH ratio set by the different carbohydrates fermented.

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(FILE 'USPAT' ENTERED AT 13:10:59 ON 09 DEC 1997)
L1 13 S (DIOL OR GLYCEROL) (2N)(DEHYDRASE OR DEHYDRATASE)

1. 5,686,276, Nov. 11, 1997, Bioconversion of a fermentable carbon source to 1,3-propanediol by a single microorganism; Lisa Anne Laffend, et al., 435/158, 252.31, 252.33 :IMAGE AVAILABLE:

2. 5,633,362, May 27, 1997, Production of 1,3-propanediol from glycerol by recombinant bacteria expressing recombinant **"diol" **dehydratase"; Vasantha Nagarajan, et al., 536/23.1; 435/252.3, 252.33; 536/22.1, 24.3 :IMAGE AVAILABLE:

3. 5,599,689, Feb. 4, 1997, Process for making 1,3-propanediol from carbohydrates using mixed microbial cultures; Sharon L. Haynie, et al., 435/42, 158 :IMAGE AVAILABLE:

4. 5,589,372, Dec. 31, 1996, Squalene synthetase; Gordon W. Robinson, 435/193, 252.3, 254.11, 320.1, 348, 355, 358, 365; 536/23.2, 24.3 :IMAGE AVAILABLE:

5. 5,480,641, Jan. 2, 1996, Feed additive which consists of whey and Lactobacillus reuteri and a method of delivering Lactobacillus reuteri to the gastrointestinal tract; Ivan A. Casas-Perez, 424/93.45, 93.4; 426/61; 435/252.9, 853 :IMAGE AVAILABLE:

6. 5,458,875, Oct. 17, 1995, In ovo method for delivering Lactobacillus reuteri to the gastrointestinal tract of poultry; Ivan A. Casas-Perez, et al., 424/93.45; 119/6.8; 424/93.4; 435/252.1, 252.9 :IMAGE AVAILABLE:

7. 5,439,678, Aug. 8, 1995, Method for inhibiting microorganism growth; Walter J. Dobrogosz, et al., 424/93.45, 93.4; 426/61; 435/34, 123, 244, 252.1; 514/693 :IMAGE AVAILABLE:

8. 5,413,960, May 9, 1995, Antibiotic reuterin; Walter J. Dobrogosz, et al., 435/189, 124, 184 :IMAGE AVAILABLE:

9. 5,405,839, Apr. 11, 1995, Vitamin B.sub.12 derivative, preparation process thereof, and use thereof; Tetsuo Toraya, et al., 514/52;536/26.4, 26.41 :IMAGE AVAILABLE:

10. 5,352,586, Oct. 4, 1994, Method of determining the presence of an antibiotic produced by Lactobacillus reuteri; Walter J. Dobrogosz, et al., 435/34, 41, 124, 183, 252.1, 853 :IMAGE AVAILABLE:

11. 5,164,309, Nov. 17, 1992, Process for the microbiological preparation of 1,3-propane-diol from glycerol by citrobacter; G. Gottschalk, et al., 435/158, 252.1 :IMAGE AVAILABLE:

12. 4,962,027, Oct. 9, 1990, Production of 3-hydroxypropionaldehyde from glycerol by Klebsiella pneumoniae; Patricia J. Slininger, et al., 435/147, 155, 244, 252.1 :IMAGE AVAILABLE:

13. 4,235,869, Nov. 25, 1980, Assay employing a labeled Fab-fragment ligand complex; Moshe Schwarzberg, 436/512; 250/302; 435/7.7, 7.72, 968; 436/513, 536, 537, 541, 800 :IMAGE AVAILABLE:

US PAT NO: 5,633,362 :IMAGE AVAILABLE: L1: 2 of 13
ABSTRACT:
A process is provided for the bioconversion of glycerol to 1,3-propanediol in which genes from a bacteria known to possess a**"diol" **"dehydratase" enzyme for 1,2-propanediol degradation are cloned into a bacterial host and the host is grown in the presence of glycerol; expression of the foreign genes in the host cell facilitates the enzymatic conversion of glycerol to 1,3-propanediol which is isolated from the culture.

What is claimed is:
1. A cosmid comprising a DNA fragment of about 35 kb isolated from Klebsiella pneumoniae wherein said fragment encodes an active **"diol" **"dehydratase" enzyme having the restriction digest in FIG. 5, columns numbered 4, said cosmid contained within a transformed E. coli deposited with the American Type Culture Collection under accession number ATCC 69790.

2. A transformed microorganism comprising a host microorganism and the cosmid of claim 1.

3. The transformed microorganism of claim 2 wherein the host microorganism is E. coli, and which is deposited with the American Type Culture Collection as accession number ATCC 69790.

4. The cosmid of claim 1 which when transformed into bacteria causes metabolism of glycerol to 1,3-propanediol.

5. A transformed microorganism comprising a host microorganism and a DNA fragment of the cosmid of claim 1, said fragment encoding an active functional protein.

6. A DNA fragment comprising a gene encoding a **"diol" **"dehydratase" enzyme, said gene encompassed by the cosmid of claim 1.

7. A isolated gene encoding an active **"diol" **"dehydratase" enzyme comprising a contiguous sequence which consists of SEQ ID NO: 1.

8. A isolated gene encoding an active alcohol dehydrogenase comprising a contiguous sequence which consists of SEQ ID NO: 2.

9. A transformed microorganism comprising a host microorganism and the heterologous gene of claim 7 or claim 8.

10. A transformed microorganism comprising E. coli DH5.alpha. and the DNA sequence of claim 7 or claim 8.

US PAT NO: 5,164,309 :IMAGE AVAILABLE: L1: 11 of 13

ABSTRACT:
A process of the microbiological preparation of 1,3 propane diol from glycerol in growth media of suitable bacterial strains is described, accompanied by the addition of a cosubstrate in the form of a H-donor and the separation of the propane diol formed. It is characterized in that a) biomass is formed in a growth phase from the selected bacterial strain and accompanied by feeding with glycerol and, if necessary, while substantially excluding the H-donor until a stationary growth phase occurs and b) further glycerol and H-donor matched to the biomass are added to the resulting stationary cell suspension for increased 1,3-propane diol formation. This process makes it possible to produce 1,3-propane diol in a high yield from glycerol with a small amount of unobjectionable by-products in a batchwise manner or in continuous form, following immobilization.

We claim:
1. In a process for the microbiological preparation of 1,3-propanediol by cultivating in a growth medium containing glycerol and a bacterial strain which is able to convert the glycerol into 1,3-propanediol and isolating the 1,3-propanediol thus obtained, the improvement which comprises the steps of:
(i) forming a biomass by culturing a bacterial strain from the Citrobacter genus in the growth medium containing glycerol, wherein the formation of the biomass is carried out with the substantial exclusion of any H donor; permitting the bacterial cells to reach a stationary cell phase; thereafter adding to said biomass additional glycerol and a sugar as an H-donor to the biomass, while keeping the cells in essentially a stationary phase; and (iv) then isolating the 1,3-propanediol thus prepared.

2. The process according to claim 1 wherein said strain is a strain of Citrobacter freundii.

3. The process according to claim 1 wherein step (i) is performed under anaerobic conditions.

4. The process according to claim 1 wherein step (ii) is preformed under anaerobic conditions.

5. The process according to claim 1 wherein a pH-value of approximately 6.5 to 8.5 is maintained in steps (i) and (iii).

6. The process according to claim 1 wherein steps (i) and (iii) are performed in a mineral medium.

7. The process according to claim 1 wherein step (i) is concluded by the addition of a predetermined quantity of phosphate or nitrogen source.

8. The process according to claim 7 wherein an ammonium salt is used as the nitrogen source or a potassium dihydrogen phosphate is used as the phosphate source.

9. The process according to claim 1 wherein glycerol is initially present in step (iii) in the amount of 0.2 to 1.5 molar concentration.

10. The process according to claim 1 wherein glycerol is initially present in step (i) in approximately 0.1 to 0.4 molar concentration.

11. The process according to claim 1 wherein said biomass obtained in step (i) is immobilized before step (iii).

12. The process according to claim 11 wherein said immobilization is carried out with calcium alginate.

US PAT NO: 4,962,027 :IMAGE AVAILABLE: L1: 12 of 13
ABSTRACT:
A method is disclosed for producing 3-hydroxypropionaldehyde (3-HPA) from glycerol by culturing the bacterium Klebsiella pneumoniae having the identifying characteristics of NRRL B-4011, under aerobic conditions, in an aqueous nutrient medium containing glycerol and a compound that causes 3-HPA to be accumulated by blocking the conversion of 3-HPA to trimethylene glycol. This process is particularly useful for the production, from renewable resources, of acrylic acid, an industrially important plymerizable monomer used in the manufacture of synthetic polymers and plastics and which is presently derived from fossil fuel sources.

We claim:
1. A method for the production of 3-hydroxypropionaldehyde (3-HPA) from glycerol, which comprises culturing the bacterium Klebsiella pneumoniae NRRL B-4011 or subcultures thereof, under aerobic conditions, in an aqueous nutrient medium containing an amount of glycerol effective for the induction of **glycerol** **dehydratase** and the production of arecoverable quantity of 3-HPA, and an amount of semicarbazide hydrochloride sufficient to prevent the conversion of 3-HPA to trimethylene glycol, until a recoverable quantity of 3-HPA is produced.

2. The method of claim 1 wherein said bacterium is first grown in an aqueous nutrient medium containg a carbon source which induces the production of dehydratase enzyme and further incubated in an aqueous medium containing glycerrol and semicarbazide hydrochloride.

3. The method of claim 2 wherein said carbon source is glycerol, 1,2-propanediol, or 1,2-ethanediol.

**********STN Columbus**********
(FILE 'HOME' ENTERED AT 14:56:30 ON 11 DEC 1997)

FILE 'MEDLINE' ENTERED AT 14:56:38 ON 11 DEC 1997
E HYDRO LYASES/CT
L1 2938 S E9
E SACCHAROMYCES/CT
L2 38378 S E3, E4
L3 145 S L1 AND L2
L4 77716 S CLONING, MOLECULAR/CT
L5 14 S L3 AND L4

L5 ANSWER 1 OF 14 MEDLINE
TI Gene identification using the yeast two-hybrid system.

L5 ANSWER 2 OF 14 MEDLINE
TI The bifunctional DCOH protein binds to HNF1 independently of its 4-alpha-carbinolamine dehydratase activity.

L5 ANSWER 3 OF 14 MEDLINE
TI Roles of the FabA and FabZ beta-hydroxyacyl-acyl carrier protein dehydratases in Escherichia coli fatty acid biosynthesis.

L5 ANSWER 4 OF 14 MEDLINE
TI Mutants that show increased sensitivity to hydrogen peroxide reveal an important role for the pentose phosphate pathway in protection of yeast against oxidative stress.

L5 ANSWER 5 OF 14 MEDLINE
TI Sticky-end polymerase chain reaction method for systematic gene disruption in Saccharomyces cerevisiae.

L5 ANSWER 6 OF 14 MEDLINE
TI Cloning of the Candida glabrata TRP1 and HIS3 genes, and construction of their disruptant strains by sequential integrative transformation.

L5 ANSWER 7 OF 14 MEDLINE
TI Molecular cloning and characterization of the Schizosaccharomyces pombe his3 gene for use as a selectable marker.

L5 ANSWER 8 OF 14 MEDLINE
TI Cloning of the dihydroxyacid dehydratase-encoding gene (ILV3) from Saccharomyces cerevisiae.

L5 ANSWER 9 OF 14 MEDLINE
TI Molecular genetics in Saccharomyces kluyveri: the HIS3 homolog and its use as a selectable marker gene in S. kluyveri and Saccharomyces cerevisiae.

L5 ANSWER 10 OF 14 MEDLINE
TI Molecular cloning of the imidazoleglycerolphosphate dehydratase gene of Trichoderma harzianum by genetic complementation in Saccharomyces cerevisiae using a direct expression vector.

L5 ANSWER 11 OF 14 MEDLINE
TI Cloning of dapD, aroD and asd of Leptospira interrogans serovar icterohaemorrhagiae, and nucleotide sequence of the asd gene.

L5 ANSWER 12 OF 14 MEDLINE
TI Molecular cloning and characterization of the aroD gene encoding 3-dehydroquinase from Salmonella typhi.

L5 ANSWER 13 OF 14 MEDLINE
TI Characterization of a leuA gene and an ARS element from Mucor circinelloides.

L5 ANSWER 14 OF 14 MEDLINE
TI Isopropylmalate dehydratase from yeast.

L5 ANSWER 5 OF 14 MEDLINE AN 96437975 MEDLINE
TI Sticky-end polymerase chain reaction method for systematic gene disruption in Saccharomyces cerevisiae.
AU Maftahi M; Gaillardin C; Nicaud J M
CS Institut National Agronomique Paris-Grignon, Laboratoire de Genetique Moleculaire et Cellulaire, INRA CNRS, Thiverval-Grignon, France.
SO YEAST, (1996 Jul) 12 (9) 859-68. Journal code: YEA. ISSN: 0749-503X. CY ENGLAND: United Kingdom DT Journal; Article; (JOURNAL ARTICLE) LA English FS Priority Journals
OS GENBANK-Z46259 EM 9702 EW 19970204
AB We describe a new procedure for the generation of plasmids containing a large promoter and terminator region of a gene of interest, useful for gene disruption. In a two-step polymerase chain reaction (PCR), a fragment, corresponding to the terminator and promoter regions separated by a 16 bp sequence containing a rare restriction site (e.g. AscI), is synthesized (T-P fragment). This PCR fragment is cloned in vectors presenting a rare blunt-end cloning site and a yeast marker for selection in Saccharomyces cerevisiae (TRP1, HIS3 and KanMX). The final plasmids are used directly for gene disruption after linearization

by the enzyme (e.g.AscI) specific for the rare restriction site. This approach was used to disrupt three open reading frames identified during the sequencing of COS14-1 from chromosome XIV of S. cerevisiae.
CT Check Tags: Support, Non-U.S. Gov't Base Sequence ****Cloning, Molecular: MT, methods*** Deoxyribonucleases, Type II Site-Specific: ME, metabolism DNA, Fungal: ME, metabolism Fungal Proteins: GE, genetics *Genes, Fungal Genetic Markers Genetic Vectors *** Hydro-Lyases: GE, genetics*** Kanamycin Resistance: GE, genetics Models, Genetic Molecular Sequence Data *Mutagenesis *Polymerase Chain Reaction: MT, methods ****Saccharomyces cerevisiae: GE, genetics*** Selection (Genetics) Transformation, Genetic
CN EC 3.1.21.- (endodeoxyribonuclease AscI); EC 3.1.21.4 (Deoxyribonucleases, Type II Site-Specific); EC 4.2.1. (Hydro-Lyases); EC 4.2.1.19 (imidazoleglycerolphosphate dehydratase); 0 (DNA, Fungal); 0 (Fungal Proteins); 0 (Genetic Markers); 0 (Genetic Vectors); 0 (TRP1 protein)

L5 ANSWER 6 OF 14 MEDLINE AN 96096521 MEDLINE
TI Cloning of the Candida glabrata TRP1 and HIS3 genes, and construction of their disruptant strains by sequential integrative transformation.
AU Kitada K; Yamaguchi E; Arisawa M
CS Department of Mycology, Nippon Roche Research Center, Kanagawa, Japan.
SO GENE, (1995 Nov 20) 165 (2) 203-6. Journal code: FOP. ISSN: 0378-1119. CY Netherlands DT Journal; Article; (JOURNAL ARTICLE) LA English FS Priority Journals
OS GENBANK-U31470; GENBANK-U31471 EM 9603
AB The Candida glabrata (Cg) TRP1 and HIS3 genes have been isolated by complementation of the Saccharomyces cerevisiae (Sc) trp1 and his3 mutants, respectively. Cg TRP1 encodes a polypeptide of 217 amino acids (aa), whose aa sequence is 58% identical to that of Sc TRP1. Cg HIS3 encodes a polypeptide of 210 aa, whose aa sequence is 73% identical to that of the Sc HIS3. Both Cg TRP1 and HIS3 were disrupted by sequential integrative transformation where the Sc URA3 was used as a selection marker for transformation. The resulting auxotrophic strain of his3- and trp1- was used to examine the ability of the Sc genes to complement the Cg mutations; Sc HIS3 and TRP1 complemented the Cg his3- and trp1- mutations, respectively.
CT Amino Acid Sequence Base Sequence *Candida: GE, genetics *** Cloning, Molecular*** *Fungal Proteins: GE, genetics *Genes, Structural, Fungal: GE, genetics Genetic Complementation Test ****Hydro-Lyases: GE, genetics*** Molecular Sequence Data *Mutagenesis Restriction Mapping *** Saccharomyces cerevisiae: GE, genetics*** Sequence Analysis, DNA Sequence Homology, Amino Acid Transformation, Genetic
CN EC 4.2.1. (Hydro-Lyases); EC 4.2.1.19 (imidazoleglycerolphosphatedehydratase); 0 (Fungal Proteins); 0 (TRP1 protein)

L5 ANSWER 7 OF 14 MEDLINE
AN 94211206 MEDLINE
TI Molecular cloning and characterization of the Schizosaccharomyces pombe his3 gene for use as a selectable marker.
AU Burke J D; Gould K L
CS Department of Cell Biology, School of Medicine, Vanderbilt University, Nashville, TN 37232..
NC GM 47728-01 (NIGMS)
SO MOLECULAR AND GENERAL GENETICS, (1994 Jan) 242 (2) 169-76. Journal code: NGP. ISSN: 0026-8925. CY GERMANY: Germany, Federal Republic of
T Journal; Article; (JOURNAL ARTICLE) LA English FS Priority Journals OS GENBANK-L19523; GENBANK-L19524 EM 9407
AB A DNA fragment which carries the his3 gene of Schizosaccharomyces pombe has been isolated and characterized for use as a selectable marker in transformations. The his3 gene encodes the imidazole acetol phosphate.transaminase enzyme (E.C.2.6.1.9), which is responsible for converting imidazole acetol-P to histidinol-P in step 8 of histidine biosynthesis. The nucleotide sequences of a 2196 bp gene fragment and a corresponding cDNA clone were determined. Three intron sequences punctuate the 1451 bp coding region which generates a predicted polypeptide of 384 amino acids with a molecular mass of 42736 daltons. Northern analysis of his3 mRNAs indicates that the transcript is approximately 1.6 kb in size. Steady-state levels are down-regulated by nitrogen limitation but are unaffected by histidine starvation. The deduced amino acid sequence was compared to the Saccharomyces cerevisiae HIS5, Escherichia coli HisC, and Salmonella typhimurium HisC proteins, all of which are imidazole acetol phosphate transaminases. The S. pombe his3 protein was 49.5% identical to the S. cerevisiae HIS5 protein and 21.5% identity was found when all four proteins were compared. The shuttle vector pBG1 was constructed by subcloning the smallest functional region of his3 and the S. pombe ars1 sequence into pUC18 for use in transformation of His3--S. pombe strains. New S. pombe strains in which the his3 gene was deleted have also been constructed.
CT Check Tags: Comparative Study; Support, Non-U.S. Gov't; Support, U.S. Gov't, P.H.S. Amino Acid Sequence Base Sequence *** Cloning, Molecular*** DNA, Fungal: GE, genetics Escherichia coli: GE, genetics *Genes, Fungal Genetic Markers Histidine: BI, biosynthesis ****Hydro-Lyases: GE, genetics*** Molecular Sequence Data Restriction Mapping *** Saccharomyces cerevisiae: GE, genetics*** Salmonella typhimurium: GE, genetics *Schizosaccharomyces: GE, genetics Schizosaccharomyces: ME, metabolism Sequence Homology, Amino Acid Transcription, Genetic RN 7006-35-1 (Histidine) CN EC 4.2.1. (Hydro-Lyases); EC 4.2.1.19 (imidazoleglycerolphosphate dehydratase); 0 (DNA, Fungal); 0 (Genetic Markers)GEN his3

L5 ANSWER 8 OF 14 MEDLINE AN 94131281 MEDLINE
TI Cloning of the dihydroxyacid dehydratase-encoding gene (ILV3) from Saccharomyces cerevisiae.
AU Velasco J A; Cansado J; Pena M C; Kawakami T; Laborda J; Notario V
CS Department of Radiation Medicine, Georgetown University Medical Center, Washington, DC 20007..
SO GENE, (1993 Dec 31) 137 (2) 179-85. Journal code: FOP. ISSN: 0378-1119. CY NetherlandsDT Journal; Article; (JOURNAL ARTICLE) LA English FS Priority Journals
OS GENBANK-L13975; GENBANK-L11589; GENBANK-L11590; GENBANK-L11591; GENBANK-L11592; GENBANK-L11593; GENBANK-L11594; GENBANK-Z15047; GENBANK-Z15048; GENBANK-L24529 EM 9405
AB The biosynthesis of branched-chain amino acids (aa) involves three shared pathways through which pyruvate or alpha-ketobutyrate are converted into alpha-keto acids, precursors of valine, leucine or isoleucine. In eukaryotes, few of these common enzymes have been purified to homogeneity, and the whole complement of biosynthetic genes has not been cloned from a single species. In yeasts, most of these genes (ILV genes) have been cloned and sequenced, with the exception of that coding for dihydroxyacid dehydratase (DAD, EC 4.2.1.9), the third enzyme in the common pathways. We have isolated Saccharomyces cerevisiae genomic sequences by hybridization to an oligodeoxyribonucleotide (oligo) probe designed from a highly conserved domain among bacterial DAD-encoding genes. The cloned sequences have been located to S. cerevisiae chromosome X, mapped within 0.4 centiMorgans (cM) of the ilv3 locus, and found to complement the ilv3 mutations of various yeast strains. Nucleotide (nt) and aa sequence analyses of the longest open reading frame (ORF) located within the cloned sequences identified them as the ILV3 gene, which codes for the yeast DAD. With our cloning of ILV3, yeast becomes the only eukaryotic system from which all ILV genes have been cloned, thus allowing direct molecular analyses of their regulation.

L5 ANSWER 9 OF 14 MEDLINE AN 93289813 MEDLINE
TI Molecular genetics in Saccharomyces kluyveri: the HIS3 homolog and its use as a selectable marker gene in S. kluyveri and Saccharomyces cerevisiae.
AU Weinstock K G; Strathern J N
CS Laboratory of Eukaryotic Gene Expression, ABL-Basic Research Program, NCI-Frederick Cancer Research and Development Center, MD 21702-1201..
SO YEAST, (1993 Apr) 9 (4) 351-61. Journal code: YEA. ISSN: 0749-503X. CY ENGLAND: United Kingdom DT Journal; Article; (JOURNAL ARTICLE) LA English FS Priority Journals
OS GENBANK-Z14125 EM 9309
AB We cloned the Saccharomyces kluyveri HIS3 homolog, k-HIS3, and made a partial deletion of the gene. The k-HIS3 gene complemented a HIS3 deletion in S. cerevisiae. The DNA sequences of the open reading frames (ORFs) of the HIS3 homologs are 70% identical at the DNA level and 83% identical at the deduced amino acid level. The ORF upstream of the k-HIS3 gene is related to the PET56 gene of S. cerevisiae found upstream of the HIS3 gene of S. cerevisiae. The ORF downstream from the k-HIS3 gene is not related to the DED1 gene found downstream of the HIS3 gene in S. cerevisiae.
CT Amino Acid Sequence Base Sequence Chromosome Mapping *** Cloning, Molecular*** *Genes, Fungal: GE, genetics Genetic Markers ****Hydro-Lyases: GE, genetics*** Molecular Sequence Data Mutagenesis ****Saccharomyces: GE, genetics*** *** Saccharomyces cerevisiae: GE, genetics*** Selection (Genetics) Sequence Analysis, DNA Transformation, Genetic Uracil: ME, metabolism RN 66-22-8 (Uracil)
CN EC 4.2.1. (Hydro-Lyases); EC 4.2.1.19 (imidazoleglycerolphosphate dehydratase); 0 (Genetic Markers)
GEN HIS3; PET56; URA3

L5 ANSWER 10 OF 14 MEDLINE AN 93024323 MEDLINE
TI Molecular cloning of the imidazoleglycerolphosphate dehydratase gene of Trichoderma harzianum by genetic complementation in Saccharomyces cerevisiae using a direct expression vector.
AU Goldman G H; Demolder J; Dewaele S; Herrera-Estrella A; Geremia R A; Van Montagu M; Contreras R
CS Laboratorium voor Genetica, Universiteit Gent, Belgium..
SO MOLECULAR AND GENERAL GENETICS, (1992 Sep) 234 (3) 481-8. Journal code: NGP. ISSN: 0026-8925. CY GERMANY: Germany, Federal Republic of DT Journal; Article; (JOURNAL ARTICLE)
LA English FS Priority Journals OS GENBANK-Z11528 EM 9301
AB The Trichoderma harzianum imidazoleglycerolphosphate dehydratase gene (igh) has been isolated by complementation of a Saccharomyces cerevisiae his3 mutant using a direct expression vector. This Escherichia coli-yeast shuttle vector was developed to allow efficient cloning and expression of cDNA libraries. The cDNA is 627 nucleotides long and codes for a protein of 209 amino acids with an apparent molecular mass of 22,466 daltons. The predicted protein sequence showed 63.6%, 58.7%, and 38.4% identity respectively to the corresponding enzymes from S. cerevisiae, Pichia pastoris and E. coli. Northern analysis showed that the expression of the igh gene in T. harzianum is not inhibited by external histidine and the level of igh mRNA was about threefold higher in cells starved of histidine.
CT Check Tags: Support, Non-U.S. Gov't Amino Acid Sequence Base Sequence *** Cloning, Molecular*** Fungal Proteins: GE, genetics Gene Expression *Genes, Structural, Fungal Genetic Complementation Test Genetic Vectors ****Hydro-Lyases: GE, genetics*** Molecular Sequence Data RNA, Messenger: GE, genetics *** Saccharomyces cerevisiae: EN, enzymology*** ****Saccharomyces cerevisiae: GE, genetics*** *Trichoderma: GE, genetics
CN EC 4.2.1. (Hydro-Lyases); EC 4.2.1.19 (imidazoleglycerolphosphate dehydratase); 0 (Fungal Proteins); 0 (RNA, Messenger)
GEN igh

L5 ANSWER 14 OF 14 MEDLINE
AN 89200982 MEDLINE
TI Isopropylmalate dehydratase from yeast.
AU Kohlhaw G B

SO METHODS IN ENZYMOLOGY, (1988) 166 423-9. Journal code: MVA. ISSN: 0076-6879. CY United States DT Journal; Article; (JOURNAL ARTICLE) LA English FS Priority Journals EM 8907
CT Chromatography, Affinity: MT, methods *** Cloning, Molecular*** Enzyme Stability *** Hydro-Lyases: GE, genetics*** ****Hydro-Lyases: IP, isolation & purification*** *** Hydro-Lyases: ME, metabolism*** Indicators and Reagents Kinetics ****Saccharomyces cerevisiae: EN, enzymology*** *** Saccharomyces cerevisiae: GE, genetics*** Spectrophotometry, Ultraviolet: MT, methods
CN EC 4.2.1. (Hydro-Lyases); EC 4.2.1.33 (3-isopropylmalate dehydratase); 0 (Indicators and Reagents)

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* *
* **WELCOME TO MESSENGER (APS TEXT) AT USPTO** *
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* **THE USPTO PRODUCTION FILES ARE CURRENT THROUGH:** *
* **JUNE 9 1998 FOR U.S. PATENT TEXT DATA.** *
* **JUNE 9 1998 FOR U.S. CURRENT CLASSIFICATION DATA.** *
* **JUNE 9 1998 FOR U.S. PATENT IMAGE DATA.** *
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* **WELCOME TO THE** *
* **U.S. PATENT TEXT FILE** *
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(FILE 'USPAT' ENTERED AT 14:39:16 ON 15 JUN 1998)
L1 13 S (DIOL OR GLYCEROL)(2N)(DEHYDRASE OR DEHYDRATASE)
L2 3 S DHAT
L3 31 S DHAB?

L2
1. 5,686,276, NOV. 11, 1997, BIOCONVERSION OF A FERMENTABLE CARBON SOURCE TO 1,3-PROPANEDIOL BY A SINGLE MICROORGANISM; LISA ANNE LAFFEND, ET AL., 435/158, 252.31, 252.33 [IMAGE AVAILABLE]

2. 5,086,386, FEB. 4, 1992, METHOD AND APPARATUS FOR BENCHMARKING THE WORKING SET OF WINDOW-BASED COMPUTER SYSTEMS; NAYEEM ISLAM, 707/202; 364/264, 264.3, 280, 280.6, 281.3, 282, 285, 286, 286.3, 927.2, 927.4, 927.63, 927.81, 928, 929.12, 931, 931.5, 932, 932.1, 932.4, 932.5, 946.2, 950, 950.3, 950.4, 957, 957.1, 957.8, 962, 962.4, 975.4, DIG.1, DIG.2; 395/182.14 [IMAGE AVAILABLE]

3. 3,948,331, APR. 6, 1976, TRACK ASSEMBLY FOR SNOWMOBILES; RICHARD E. ESCH, 305/132; 180/193 [IMAGE AVAILABLE]

US PAT NO: 5,686,276 [IMAGE AVAILABLE] L2: 1 OF 3
SUMMARY: BSUM(14) IN KLEBSIELLA PNEUMONIAE AND CITROBACTER FREUNDII, THE GENES ENCODING THE FUNCTIONALLY LINKED ACTIVITIES OF GLYCEROL DEHYDRATASE (DHAB), 1,3-PROPANEDIOL OXIDOREDUCTASE (**DHAT**), GLYCEROL DEHYDROGENASE (DHAD), AND DIHYDROXYACETONE KINASE (DHAK) ARE ENCOMPASSED BY THE DHA REGULON. THE DHA REGULONS FROM CITROBACTER AND KLEBSIELLA. . .

DETDESC: DETD(60) THE . . . ACHIEVED BY PLACING THE NECESSARY STRUCTURAL GENES UNDER THE CONTROL OF ALTERNATE PROMOTORS AS HAS BEEN DEMONSTRATED FOR 1,3-PROPANEDIOL OXIDOREDUCTASE (**DHAT**) FROM C. FREUNDII AND DIOL DEHYDRATASE FROM K. OXYTOCA ATCC 8724 (DANIEL ET AL., J. BACTERIOL. 177, 2151 (1995) AND. . .

L3
1. 5,753,723, MAY 19, 1998, DENTURE FIXATIVE WITH AN ADHESION PROMOTER; TIANG SHING CHANG, ET AL., 523/120; 106/35; 514/574; 524/42, 239, 321, 549, 559 [IMAGE AVAILABLE]

2. 5,750,591, MAY 12, 1998, DENTURE ADHESIVE CONTAINING PARTIAL IRCONIUM, CALCIUM, SODIUM GANTREZ SALT; HAL C. CLARKE, ET AL., 523/120; 433/228.1; 523/118; 524/45, 559; 525/370 [IMAGE AVAILABLE]

3. 5,723,106, MAR. 3, 1998, REDUCED ALCOHOL MOUTHWASH ANTISEPTIC AND ANTISEPTIC PREPARATION; R. MICHAEL BUCH, ET AL., 424/49, 58 [IMAGE AVAILABLE]

4. 5,699,269, DEC. 16, 1997, METHOD FOR PREDICTING CHEMICAL OR PHYSICAL PROPERTIES OF CRUDE OILS; TERRENCE RODNEY ASHE, ET AL., 702/30; 436/29, 60 [IMAGE AVAILABLE]

5. 5,696,181, DEC. 9, 1997, DENTURE FIXATIVE; TIANG-SHING CHANG, ET AL., 523/118; 430/180; 523/120; 524/28, 45, 55, 377, 439, 440 [IMAGE AVAILABLE]

6. 5,686,276, NOV. 11, 1997, BIOCONVERSION OF A FERMENTABLE CARBON SOURCE TO 1,3-PROPANEDIOL BY A SINGLE MICROORGANISM; LISA ANNE LAFFEND, ET AL., 435/158, 252.31, 252.33 [IMAGE AVAILABLE]

7. 5,650,479, JUL. 22, 1997, INTERFACIALLY POLYMERIZED POLYESTER FILMS; PAUL G. GLUGLA, ET AL., 528/194; 95/43, 54; 210/500.21, 500.26; 528/176, 193 [IMAGE AVAILABLE]

8. 5,569,581, OCT. 29, 1996, ALTERATION AND PREDICTION OF MALE FERTILITY USING SEMINAL PLASMA AND ITS COMPONENTS; GARY KILLIAN, ET AL., 435/4; 424/520; 435/806 [IMAGE AVAILABLE]

9. 5,561,177, OCT. 1, 1996, HYDROCARBON FREE DENTURE ADHESIVE; NILOFAR KHALEDI, ET AL., 524/35; 433/180; 523/120; 524/43, 45, 313, 492 [IMAGE AVAILABLE]

10. 5,543,443, AUG. 6, 1996, DENTURE STABILIZING COMPOSITIONS; JAYANTH RAJAIAH, ET AL., 523/120; 522/148; 523/116, 118; 524/28, 31, 45, 55, 261, 267, 377, 522, 557; 525/100, 101, 102, 207, 328.9, 366, 474, 477, 478, 479; 526/279; 528/15, 26, 31, 32, 33, 374 [IMAGE AVAILABLE]

11. 5,461,155, OCT. 24, 1995, ORGANIC SOLUBLE METAL-AZO AND METAL-AZOMETHINE DYES; TERRANCE P. SMI[redacted] ET AL., 546/12 [IMAGE AVAILABLE]

12. 5,424,058, JUN. 13, 1995, DENTURE STABILIZING COMPOSITIONS COMPRISING A MIXED PARTIAL SALT OF A LOWER ALKYL VINYL ETHER-MALEIC ACID COPOLYMER; JAYANTH RAJAIAH, ET AL., 424/49; 106/35; 523/120; 525/328.9, 366, 370; 526/240 [IMAGE AVAILABLE]

13. 5,405,836, APR. 11, 1995, PET FOODS WITH WATER-SOLUBLE ZINC COMPOUND COATING FOR CONTROLLING MALODOROUS BREATH; THOMAS RICHAR, ET AL., 514/23; 424/49, 53, 439, 442; 426/72, 74, 805 [IMAGE AVAILABLE]

14. 5,314,998, MAY 24, 1994, ORGANIC SOLVENT-SOLUBLE METAL-AZO AND METAL-AZOMETHINE DYES; TERRANCE P. SMITH, ET AL., 534/701, 710, 711, 713, 723 [IMAGE AVAILABLE]

15. 5,304,616, APR. 19, 1994, DENTURE STABILIZING COMPOSITIONS HAVING IMPROVED HOLD; JAYANTH RAJAIAH, ET AL., 526/240; 523/118, 120; 525/327.8 [IMAGE AVAILABLE]

16. 5,242,834, SEP. 7, 1993, ANALYSIS OF ALUMINUM IN AMINO ACIDS BY HIGH PERFORMANCE LIQUID CHROMATOGRAPHY; DURGA V. SUBRAMANIAN, 436/73; 73/61.52; 210/656; 436/74, 161, 174, 175, 182 [IMAGE AVAILABLE]

17. 5,225,514, JUL. 6, 1993, AZO CONTAINING POLYURETHANES FOR DRUG DELIVERY TO THE LARGE INTESTINES; YOSHIHARU KIMURA, ET AL., 528/76; 514/772.3; 528/85 [IMAGE AVAILABLE]

18. 5,165,914, NOV. 24, 1992, ORAL COMPOSITIONS CONTAINING ZINC LACTATE COMPLEXES; RICHARD S. VLOCK, 424/52, 49, 641, 642, 643, 673, 676 [IMAGE AVAILABLE]

19. 5,094,845, MAR. 10, 1992, ORAL COMPOSITIONS CONTAINING ZINC GLUCONATE COMPLEXES; RICHARD S. VLOCK, 424/52, 49, 53, 55, 613, 641, 643, 673 [IMAGE AVAILABLE]

20. 5,073,604, DEC. 17, 1991, DENTURE STABILIZING COMPOSITIONS; KENNETH T. HOLEVA, ET AL., 525/327.8; 523/120; 525/327.9, 328.9, 366, 370; 526/240 [IMAGE AVAILABLE]

21. 5,050,692, SEP. 24, 1991, METHOD FOR DIRECTIONAL DRILLING OF SUBTERRANEAN WELLS; HERBERT W. BEIMGRABEN, 175/61, 74, 76, 256 [IMAGE AVAILABLE]

22. 4,980,391, DEC. 25, 1990, DENTURE ADHESIVES AND METHODS FOR PREPARING SAME; LORI D. KUMAR, ET AL., 524/45; 106/35; 523/120; 524/492 [IMAGE AVAILABLE]

23. 4,948,580, AUG. 14, 1990, MUCO-BIOADHESIVE COMPOSITION; IVAN BROWNING, 514/772.5; 424/434, 435, 443, 447, 448, 484; 514/944, 969 [IMAGE AVAILABLE]

24. 4,937,066, JUN. 26, 1990, ZINC CONTAINING ORAL COMPOSITIONS; RICHARD S. VLOCK, 424/52, 49, 53, 55, 613, 614, 641, 643, 673 [IMAGE AVAILABLE]

25. 4,817,740, APR. 4, 1989, APPARATUS FOR DIRECTIONAL DRILLING OF SUBTERRANEAN WELLS; HERBERT W. BEIMGRABEN, 175/74, 76, 256 [IMAGE AVAILABLE]

26 4,747,415, MAY 31, 1988, METHOD AND DEVICE FOR MEASURING PENILE RIGIDITY; PIERRE LAVOISIER, 600/587, 507 [IMAGE AVAILABLE]

27. 4,717,260, JAN. 5, 1988, TIME DIFFERENTIAL CORRECTING ANALOG TIMEPIECE OF TWENTY-FOUR HOUR SYSTEM; SHIGERU TSUJI, 368/21; 968/167, DIG.1 [IMAGE AVAILABLE]

28. 4,560,013, DEC. 24, 1985, APPARATUS FOR DIRECTIONAL DRILLING AND THE LIKE OF SUBTERRANEAN WELLS; HERBERT W. BEIMGRABEN, 175/73, 325.2 [IMAGE AVAILABLE]

29. 4,404,088, SEP. 13, 1983, THREE-STAGE HYDROCRACKING PROCESS; ROBERT W. BACHTEL, ET AL., 208/59, 111 [IMAGE AVAILABLE]

30. 3,926,577, DEC. 16, 1975, CORROSION INHIBITOR FOR VANADIUM-CONTAINING FUELS; MICHAEL J. ZETLMEISL, ET AL., 44/320, 354; 252/387 [IMAGE AVAILABLE]

31. 3,691,408, SEP. 12, 1972, METHOD AND MEANS FOR THERMOELECTRIC GENERATION OF ELECTRICAL ENERGY; JOHN B. ROSSO, 310/306; 62/5; 136/209, 211 [IMAGE AVAILABLE]

US PAT NO: 5,686,276 [IMAGE AVAILABLE] L3: 6 OF 31
SUMMARY: BSUM(14) IN KLEBSIELLA PNEUMONIAE AND CITROBACTER FREUNDII, THE GENES ENCODING THE FUNCTIONALLY LINKED ACTIVITIES OF GLYCEROL DEHYDRATASE (**DHAB**), 1,3-PROPANEDIOL OXIDOREDUCTASE (DHAT), GLYCEROL DEHYDROGENASE (DHAD), AND DIHYDROXYACETONE KINASE (DHAK) ARE ENCOMPASSED BY THE DHA REGULON. THE DHA REGULONS FROM. . .

**********Welcome to STN International**********
**********STN Columbus**********
(FILE 'HOME' ENTERED AT 15:35:10 ON 15 JUN 1998)

FILE 'REGISTRY' ENTERED AT 15:35:25 ON 15 JUN 1998
L1 40518 S 1, 3-PROPANEDIOL
L2 7000 S GLYCEROL
L3 74 S DIHYDROXYACETONE

FILE 'CAPLUS' ENTERED AT 15:36:41 ON 15 JUN 1998

FILE 'REGISTRY' ENTERED AT 15:44:28 ON 15 JUN 1998
L4 1 S GLYCEROL DEHYDRATASE

FILE 'CAPLUS' ENTERED AT 15:44:53 ON 15 JUN 1998
L5 61 S L4
L6 94627 S ASPERGILLUS OR SACCHAROMYCES OR ZYGOSACCHAROMYCES OR PICHIA OR KLUYVEROMYCES OR CANDIDA OR HANSENULA
L7 136502 S DEBARYOMYCES OR MUCOR OR TORULOPSIS OR METHYLOBACTER OR SALMONELLA OR BACILLUS OR STREPTOMYCES OR PSEUDOMONAS
L8 222558 S L6 OR L7
L9 3 S L5 AND L8
L10 6439 S 1, 3-PROPANEDIOL
L11 108 S L8 AND L10 NOT L9
L12 219 S 504-63-2P/IT
L13 8 S L12 AND L8

L9 ANSWER 1 OF 3 CAPLUS COPYRIGHT 1998 ACS
AN 1997:34085 CAPLUS DN 126:58953
TI Bioconversion of a fermentable carbon source to 1,3-propanediol by a single microorganism expressing a foreign glycerol or diol dehydratase gene
IN Laffend, Lisa Anne; Nagarajan, Vasantha; Nakamura, Charles Edwin
PA E.I. Du Pont De Nemours and Company, USA; Genencor International, Inc.; Laffend, Lisa Anne; Nagarajan, Vasantha; Nakamura, Charles Edwin
SO PCT Int. Appl., 109 pp. CODEN: PIXXD2
PI WO 9635796 A1 961114
DS W: AL, AU, BB, BG, BR, CA, CN, CZ, EE, GE, HU, IS, JP, KP, KR, LK, LR, LT, LV, MG, MK, MN, MX, NO, NZ, PL, RO, SG, SI, SK, TR, TT, UA, US, UZ, VN, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM
RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG
AI WO 96-US6705 960510 PRAI US 95-440293 950512 DT Patent LA English
AB A process is provided for the bioconversion of a carbon substrate, preferably glucose, to 1,3-propanediol by a single organism utilizing microorganisms contg. the genes encoding for an active glycerol or diol dehydratase enzyme. Specifically, the glycerol dehydratase gene of Klebsiella pneumoniae is used to prep. a transgenic microorganism capable of forming 1,3-propanediol from glucose in high yield. A cosmid covering the dha regulon of K. pneumoniae was cloned and the gene for the dehydratase (dhaB1, dhaB2, dhaB3) and the propanediol dehydrogenase were cloned and expressed in a variety of prokaryotic and eukaryotic microbial hosts with the manuf. of the propanediol from glucose or maltose demonstrated.

L9 ANSWER 2 OF 3 CAPLUS COPYRIGHT 1998 ACS
AN 1997:6102 CAPLUS DN 126:30403
TI Process for making 1,3-propanediol from carbohydrates using mixed microbial cultures
IN Haynie, Sharon Loretta; Wagner, Lorraine Winona
PA E.I. Du Pont De Nemours and Company, USA; Haynie, Sharon Loretta; Wagner, Lorraine Winona
SO PCT Int. Appl., 30 pp. CODEN: PIXXD2
PI WO 9635799 A1 961114
DS W: AL, AU, BB, BG, BR, CA, CN, CZ, EE, GE, HU, IS, JP, KP, KR, LK, LR, LT, LV, MG, MK, MN, MX, NO, NZ, PL, RO, SG, SI, SK, TR, TT, UA, US, UZ, VN, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM
RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG
AI WO 96-US6161 960502 PRAI US 95-440379 950512 DT Patent LA English
AB The present invention provides a process for the biotransformation of a carbohydrate C source to 1,3-propanediol using mixed yeast and bacterial cultures wherein the carbohydrate is 1st Fermented to glycerol by the yeast cell and then converted to 1,3-propanediol by the bacterial cell contg. an active diol or glycerol dehydratase enzyme. In this process both the yeast and bacterial cultures are supported on the same C source and 1,3-propanediol is isolated from the media.

L9 ANSWER 3 OF 3 CAPLUS COPYRIGHT 1998 ACS
AN 1995:841557 CAPLUS DN 124:46914
TI Rapid expansion of the physical and genetic map of the chromosome of Clostridium perfringens CPN50
AU Katayama, Sei-Ichi; Dupuy, Bruno; Garnier, Thierry; Cole, Stewart T.
CS Unite Genetique Moleculaire Bacterienne, Inst. Pasteur, Paris, 75724, Fr.
SO J. Bacteriol. (1995), 177(19), 5680-5 CODEN: JOBAAY; ISSN: 0021-9193 DT Journal LA English
AB The phys. map of the 3.6-megabase chromosome of Clostridium perfringens CPN50 was extended by positioning sites for the endonucleases SfiI and I-CeuI, and in parallel, the gene map was
expanded by using a genome scanning strategy. This involved the cloning and sequencing of random chromosomal fragments, identification of the functions of the putative genes by database searches, and then hybridization anal. The current gene map comprises almost 100 markers, many of which encode housekeeping functions while others are involved in sporulation or Pathogenesis. Strikingly, most of the virulence genes were found to be confined to a 1200-kb segment of the chromosome near oriC, while the pleiotropic regulatory locus, virRS, was situated toward the putative replication terminus. A comparison of the gene maps of 3 endospore-forming bacilli, C. perfringens, Clostridium beijerinckii, and *Bacillus* subtilis, revealed a similar order and distribution of key sporulation and heat shock genes which might reflect an ancient evolutionary relationship.

L13 ANSWER 1 OF 8 CAPLUS COPYRIGHT 1998 ACS
TI Metabolic engineering of propanediol pathways

L13 ANSWER 2 OF 8 CAPLUS COPYRIGHT 1998 ACS
TI Metabolic engineering of an improved 1,3-propanediol fermentation (Klebsiella pneumoniae, *Bacillus* licheniformis)

L13 ANSWER 3 OF 8 CAPLUS COPYRIGHT 1998 ACS
TI Production of 1,3-propanediol from glycerol by recombinant bacteria expressing recombinant diol dehydratase

L13 ANSWER 4 OF 8 CAPLUS COPYRIGHT 1998 ACS
TI Bioconversion of a fermentable carbon source to 1,3-propanediol by a single microorganism expressing a foreign glycerol or diol dehydratase gene

L13 ANSWER 5 OF 8 CAPLUS COPYRIGHT 1998 ACS
TI Process for making 1,3-propanediol from carbohydrates using mixed microbial cultures

L13 ANSWER 6 OF 8 CAPLUS COPYRIGHT 1998 ACS

TI Microbial production and downstream processing of 2,3-butanediol

L13 ANSWER 7 OF 8 CAPLUS COPYRIGHT 1998 ACS
TI Fermentative manufacture of 1,3-propanediol from glycerol

L13 ANSWER 8 OF 8 CAPLUS COPYRIGHT 1998 ACS
TI Neutral solvent production from halophilic, photolithotrophically grown algae by linked fermentations

L13 ANSWER 1 OF 8 CAPLUS COPYRIGHT 1998 ACS
AN 1998:56526 CAPLUS DN 128:87891
TI Metabolic engineering of propanediol pathways
AU Cameron, D. C.; Altaras, N. E.; Hoffman, M. L.; Shaw, A. J.
CS Department of Chemical Engineering, University of WisconsinMadison, Madison, WI, USA
SO Biotechnol. Prog. (1998), 14(1), 116-125 CODEN: BIPRET; ISSN: 8756-7938 PB American Chemical Society DT Journal; General Review LA English
AB A review with many refs. Microbial fermn. is an important technol. for the conversion of renewable resources to chems. In this paper, the authors describe the application of metabolic ngineering for the development of two new fermn. processes: the microbial conversion of sugars to 1,3-propanediol (1,3-PD) and 1,2-propanediol (1,2-PD). A variety of naturally occurring organisms ferment glycerol to 1,3-PD, but no natural organisms ferment sugars directly to 1,3-PD. The authors first describe the fed-batch fermn. Of glycerol to 1,3-PD by Klebsiella pneumoniae. They then present various approaches for the conversion of sugars to 1,3-PD, including mixed-culture fermn., cofermentation of glycerol and glucose, and metabolic engineering of a "sugars to 1,3-PD" pathway in a Single organism. Results are reported for the expression of genes from the K. pneumoniae 1,3-PD pathway in "Saccharomyces" cerevisiae. The best naturally occurring organism for the fermn. of sugars to 1,2-PD is Thermoanaerobacterium thermosaccharolyticum. The authors describe the fermn. of several different sugars to 1,2-PD by this organism in batch and continuous culture. They report that Escherichia coli strains engineered to express either aldose reductase or glycerol dehydrogenase convert glucose to (R)-1,2-PD. The authors then analyze the ultimate potential of fermn. Processes for the prodn. of propanediols. Linear optimization studies indicate that, under aerobic conditions, propanediol yields that approach the theor. max. are possible and CO2 is the primary coproduct. Without the need to produce acetate, final product titers in the range of 100 g/L should be possible; the high titers and low coproduct levels should make product recovery and purifn. straightforward. The examples given in this paper illustrate the importance of metabolic engineering for fermn. process development in general.

L13 ANSWER 2 OF 8 CAPLUS COPYRIGHT 1998 ACS
AN 1997:517535 CAPLUS DN 127:123605
TI Metabolic engineering of an improved 1,3-propanediol fermentation (Klebsiella pneumoniae, "Bacillus" licheniformis)
AU Skraly, Frank Anthony
CS Univ. of Wisconsin, Madison, WI, USA
SO (1997) 221 pp. Avail.: UMI, Order No. DA9716075 From: Diss. Abstr. Int., B 1997, 58(3), 1414 DT Dissertation LA English
AB Unavailable

L13 ANSWER 7 OF 8 CAPLUS COPYRIGHT 1998 ACS
AN 1990:234037 CAPLUS DN 112:234037
TI Fermentative manufacture of 1,3-propanediol from glycerol
IN Kretschmann, Josef; Carduck, Franz Josef; Deckwer, Wolf Dieter; Tag, Carmen
PA Henkel K.-G.a.A., Fed. Rep. Ger.; Gesellschaft fuer Biotechnologische Forschung m.b.H. (GBF)
SO Ger. Offen., 7 pp. CODEN: GWXXBX
PI DE 3829618 A1 900315 AI DE 88-3829618 880901 DT Patent LA German
AB Propane-1,3-diol is manufd. from a glycerol-contg. soln. (5-20% by wt.) with a microorganism such as Clostridium, Enterobacterium, Lactobacillus, "Bacillus", Citrobacter, or Klebsiella in a yield of .gtoreq.0.5 g/h/L. Klebsiella pneumoniae DSM 2026 was batch-cultured at 37.degree. under anaerobic conditions to yield a max. of 2.3 g propane-1,3-diol from a starting glycerol concn. Of 100 g/L; other glycerol concns. (50-200 g/L) produced lower yields.

L13 ANSWER 8 OF 8 CAPLUS COPYRIGHT 1998 ACS
AN 1983:214106 CAPLUS DN 98:214106
TI Neutral solvent production from halophilic, photolithotrophically grown algae by linked fermentations
AU Nakas, J. P.; Schaedle, M.; Parkinson, C. M.; Coonley, C. E.; Tanenbaum, S. W.
CS Coll. Environ. Sci. For., SUNY, Syracuse, NY, 13210, USA
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AB Five species of Dunaliella were examd. for glycerol [56-81-5] accumulation, growth rate, cell d., and protein and chlorophyll content. The suitability of each algal species for such bioconversions was judged according to glycerol accumulation and quantities of neutral solvents produced after sequential bacterial fermns. When grown in 2M NaCl, with 24 mM NaHCO3 or 3% CO2 at28.degree., and with 25,000 lx at container surface, 4 of the 5 species tested (D. tertiolecta, D. primolecta, D. parva, and D. bardawil) produced 10-20 mg of glycerol/L. A Clostridium converted an algal biomass mixt. supplemented with 4% glycerol to .apprx.18 g/L of mixed alcs. (EtOH [64-17-5], 1,3-propanediol [504-63-2], and BuOH [71-36-3]). Acetone was not detected. A soil isolate, tentatively classified as a member of the genus "Bacillus", converts glycerol into EtOH at a final concn. of 7.0-9.6 g/L. An enrichment culture from sewage sludge resolved to contain 2 gram-neg. rods converts the algal biomass-glycerol mixt. solely to 1,3-propanediol [504-63-2] at a final concn. of 4.2-5.3 g/L. Addnl., Dunaliella concs., of .ltoreq.200-fold, can be directly fermented to mixed solvents.